BUYER ISSUES REPORT

1988

INPUT

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Abstract

To meet today's ever-increasing demand for more strategic and complex information systems, organizations are turning to outsiders for the solution, and for management of the entire systems deployment project. A "Systems Integrator" is being selected, often by senior user management, to provide a total information-technology-based solution for strategic business needs. Turning to the outside brings with it many new challenges and risks, and greatly impacts the information systems process and function within the organization.

In this report INPUT examines the issues faced by the buyer of systems integration services. The report starts with the driving forces and major issues facing the information systems function and then looks in depth at the elements of employing a systems integrator from three points of view: corporate, information systems, and end user. The findings draw on INPUT's ongoing tracking of actual systems integration projects.

INPUT concludes that the keys to success for the systems integrator and the buyer are found in the communication processes established early in the project, the depth of involvement of the actual user (do it early and in-depth) and the process by which the systems integrator is selected. In cases where these elements were rated unimportant, the success of the project was modest at best.

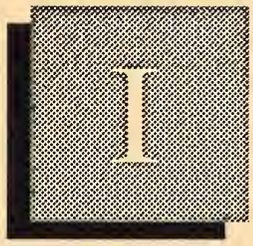
Table of Contents

Table of Contents (Continued)

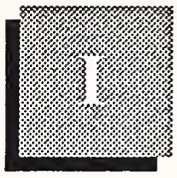
Table of Contents (Continued)

Exhibits

Exhibits (Continued)



Introduction



Introduction

This report on Buyers' Issues was prepared as part of the INPUT Systems Integration Planning Service (SIPS).

It is one of three research reports to be published in 1988. The second report, *Systems Integration Forecasts and Trends*, will focus on the standard INPUT industry-specific categories and will include the five-year forecasts. The third report, *Competitive Analysis*, will address the Systems Integration Market from the vendors' perspective.

Commercial Systems Integration is new and evolving and offers vendors and buyers an often-unique opportunity to advance the use of information technology. INPUT recognized this emerging market early in 1986 and initiated a series of research reports that drew considerable attention throughout the industry. This report is a continuation of that awareness.

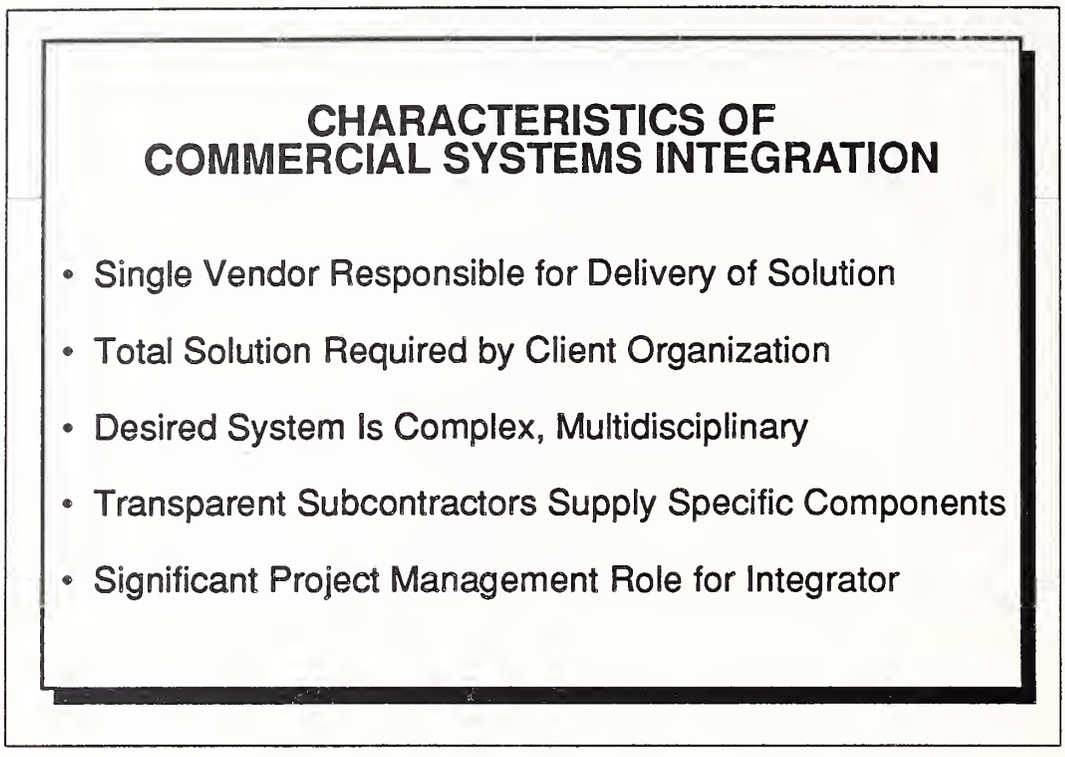
Commercial Systems Integration (CSI) is defined as a single vendor assuming sole-source responsibility for the provision of a "total solution" to a complex, multidisciplinary information systems requirement. In its most common form the "sole-source responsibility" is an external organization (i.e., a vendor) that assumes a significant project management role for the entire project and, therefore, is the "integrator of the system." Refer to Exhibit I-1 for a list of characteristics of CSI.

A Purpose

To date, INPUT's research has focused on the trends of this emerging market and the success factors—all from the vendors' point of view. In this report INPUT has assessed CSI from the buyers' point of view. The report objectives are:

- To understand the environment and forces that lead an organization to consider a systems integration approach.

EXHIBIT I-1



- To assess the implications of systems integration from the viewpoints of the corporate staff, the information systems function, and the end user.

- To identify and understand the issues and aspects of systems integration that lead to a successful project.

B

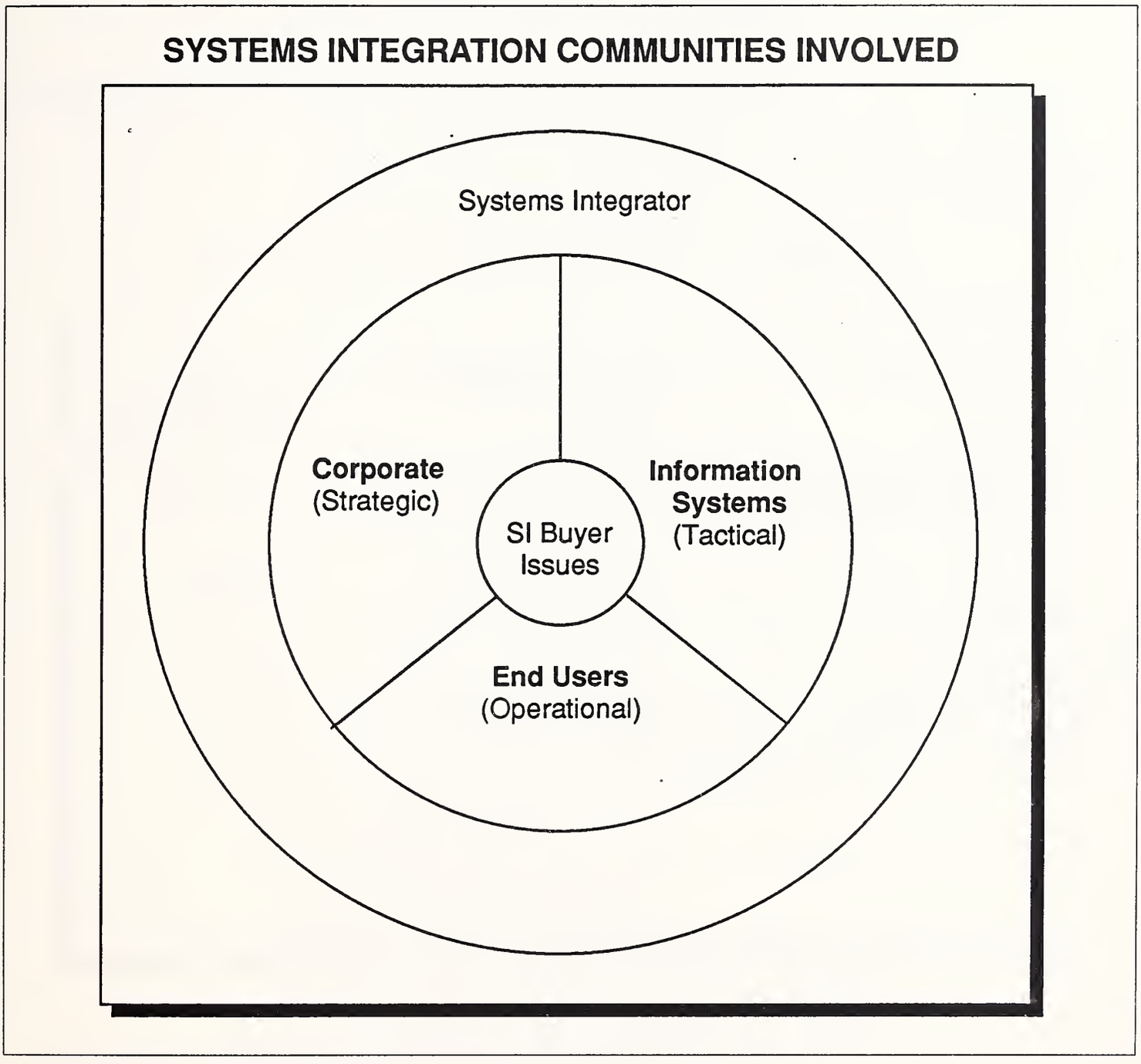
Scope

To gain a full understanding of the buyer's point of view, INPUT believes the reader needs to understand the information technology challenge facing today's organization (the top-down view) and to identify the critical success factors that lead to the use of the systems integration concept (the bottom-up view).

This report starts with INPUT's view of the information technology challenge to the information systems function. What are the driving forces, the major issues, and the future responsibilities of the corporate information systems function; and why would these lead to the use of systems integrators? The objective is a framework within which to place the systems integration approach.

Then INPUT looks at the CSI process from two perspectives: the communities involved and the elements that make up the systems integration process. There are three communities involved in CSI. These communities and their respective roles with CSI are depicted in Exhibit I-2 and are as follows:

EXHIBIT I-2



- The corporate viewpoint, with emphasis on strategic impact of information technology.

- The Information Systems (IS) resource, which is typically targeted for the design and review of specifications, and for liaison between the company and the systems integration vendor. IS plays the role of tactician in a CSI project.

- The end user, who is responsible for the successful operation of the system on a daily basis.

It is through the eyes of these three groups that the critical success factors for systems integration can be identified.

The second perspective is the process issues. Those addressed by this research are listed, and indexed by the communities in Exhibit I-3.

EXHIBIT I-3

SYSTEMS INTEGRATION PROCESS ELEMENTS

Corporate View (Strategic)	Information Systems Issues and Role (Tactical)	End-User Considerations (Operational)
Systems Integration -Rationale and Process	Project Definition	Involvement
Financial Implications	Acceptance Criteria	Training
Legal Concerns	Bid Process	
Project Approval	Selection Criteria	
Stewardship Role	Technology Review	
	Project Management	
	Environmental & Organizational Impact	

- Issues addressed within the corporate context included the business rationale for engaging an outside systems integration company, the financial implications, the legal concerns, the approval process, and the timeframes involved in initiating the project.

- Areas of concern directed at the information systems resource consisted of the project definition process, acceptance model, selection criteria, bid process, project technology review issues, and environmental and organizational impact.

- The end-user community was queried relative to its participation during the planning, implementation, and testing of the system. The

scope of training and education, along with overall satisfaction levels, was also measured and recorded.

C Methodology

The findings in this report draw on two sources of research. First is INPUT's ongoing research into the information systems function. INPUT's Information Systems Program conducts over 500 interviews annually with information systems management on issues, trends, and how they are working to meet their changing role in the organization.

Second, and specifically for this report, INPUT conducted in-depth interviews on current and completed CSI projects with representatives of the three communities described above, and used the research in the project-tracking service that is part of the Systems Integration Planning Service.

The first defines the current IS environment and sets the stage for the systems integration approach to systems development. The second provides the bottom-up view based on actual experience of elements most critical to success with CSI.

The following criteria were used in selecting projects for this study:

- The systems integrator must be an outside organization and be committed to total responsibility for the project. (Although some organizations have internal systems integrators, projects of this type are excluded because they do not have the required buyer/vendor interaction deemed necessary to identify the elements of success.)

- The hardware mix had to consist of equipment supplied by different vendors.

  - All projects had to include custom software development and/or enhancements/modifications to existing packages.

  - Communications was desirable but not mandatory.

The systems integration projects referenced in this report range from less than a million dollars to over a hundred million dollars in value. Manufacturing represents 40% of the projects, financial 33%, and the remaining 27% is a cross-section of other industries and applications. Fifteen projects were studied in detail for this report. More than one interview was conducted on all of the projects and in most instances an interview was conducted in each of the three communities.

Companies that participated were assured of their privacy in order to obtain as much factual and useful data as possible. The synthesis of this information is reported throughout this publication. INPUT is apprecia-

tive of the cooperation extended by the various organizations that participated in this effort. In addition, INPUT would like to thank its sponsors that assisted in identifying client companies as candidates for this research.

D

Related INPUT Reports

Recent INPUT research reports of direct relevance to the Systems Integration area include:

- *Commercial Systems Integration Implementations*
- *Federal Government Systems Integration Market*
- *U.S. Professional Services Market, 1987-1992*
- *Federal Government Professional Services Market*
- *Information Systems Planning Report*
- *European Systems Integration Market*

Executive Overview

II

Executive Overview

A Introduction

Today the internal Information Systems (IS) function is facing significant new challenges. These challenges are a result of the business conditions of today, which demand rapid strategic response, and of the recent years of emphasis on distributed processing and end-user computing. Most of today's information networks are dispersed, loosely integrated at best, and at times restrict the ability of the organizations to respond with the speed required by today's business environment.

Out of these restrictions has developed a new approach to the development and deployment of major systems. The change is from the fundamentally piecemeal process of the late 1970s and 1980s to an integrated business systems approach as we reach the 1990s. This new approach is referred to as "Systems Integration" and typically involves the use of an outside vendor to provide the leadership and skills to accomplish the project in the timeframe required by the business (that is, to implement the information-technology-based business solution).

The characteristics of commercial systems integration are provided in Exhibit II-1.

B Environment

INPUT has been analyzing the systems integration phenomena for a number of years and has recently assessed the topic from the "buyer's" point of view.

- What causes the large corporation with its internal systems function to turn to an outsider to provide its most important information systems?
- How does the buyer go about assuring success?

INPUT has looked at these questions from two perspectives, as shown in Exhibit II-2.

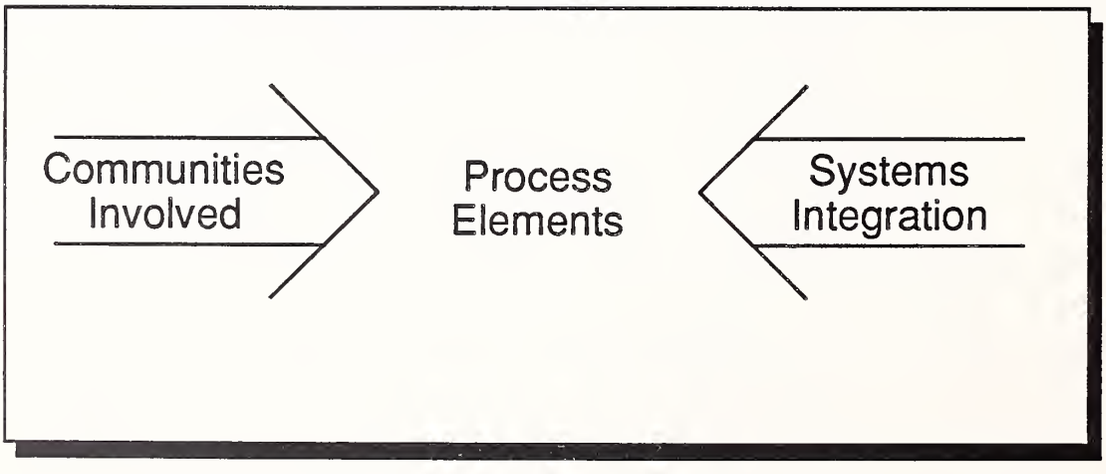
EXHIBIT II-1

CHARACTERISTICS OF COMMERCIAL SYSTEMS INTEGRATION

- Single Vendor Responsible for Delivery of Solution
- Total Solution Required by Client Organization
- Desired System Is Complex, Multidisciplinary
- Transparent Subcontractors Supply Specific Components
- Significant Project Management Role for Integrator

EXHIBIT II-2

BUYER ISSUES FRAMEWORK—TWO PERSPECTIVES



- First, from the perspective of the three communities involved: corporate, information systems, and end-user.
- Second, from the point-of-view of the elements (issues) that make up the systems integration process—in particular, those that deal with the project initiation and management tasks and the interface between the buyer and the systems integrator (vendor).

Exhibit II-3 lists and categorizes the key process elements by community.

EXHIBIT II-3

SYSTEMS INTEGRATION PROCESS ELEMENTS

Corporate View (Strategic)	Information Systems Issues and Role (Tactical)	End-User Considerations (Operational)
Systems Integration -Rationale and Process	Project Definition	Involvement
Financial Implications	Acceptance Criteria	Training
Legal Concerns	Bid Process	
Project Approval	Selection Criteria	
Stewardship Role	Technology Review	
	Project Management	
	Environmental & Organizational Impact	

To understand why an organization would go outside to address its most strategic systems needs, it is necessary to understand the current state of most internal information systems environments (network and organization). Information technology is playing an ever-increasing role in the competitive posture and success of today's organization. The result is increasing senior and operating management involvement. Information technology is often specifying the conceptual solutions, often including immense complexity, and setting a timeframe for implementation that the internal systems organization is not capable of supporting.

At the same time the IS function is facing its own challenges that have evolved from the last fifteen years of application development, distributed processing, the personal computer, etc. IS remains responsible for operating the existing information network at the same time that the business is being challenged to rapidly make more strategic use of information technology.

Exhibit II-4 lists the critical focus of IS management as we enter the 1990s.

EXHIBIT II-4

INFORMATION SYSTEMS MANAGEMENT FOCUS

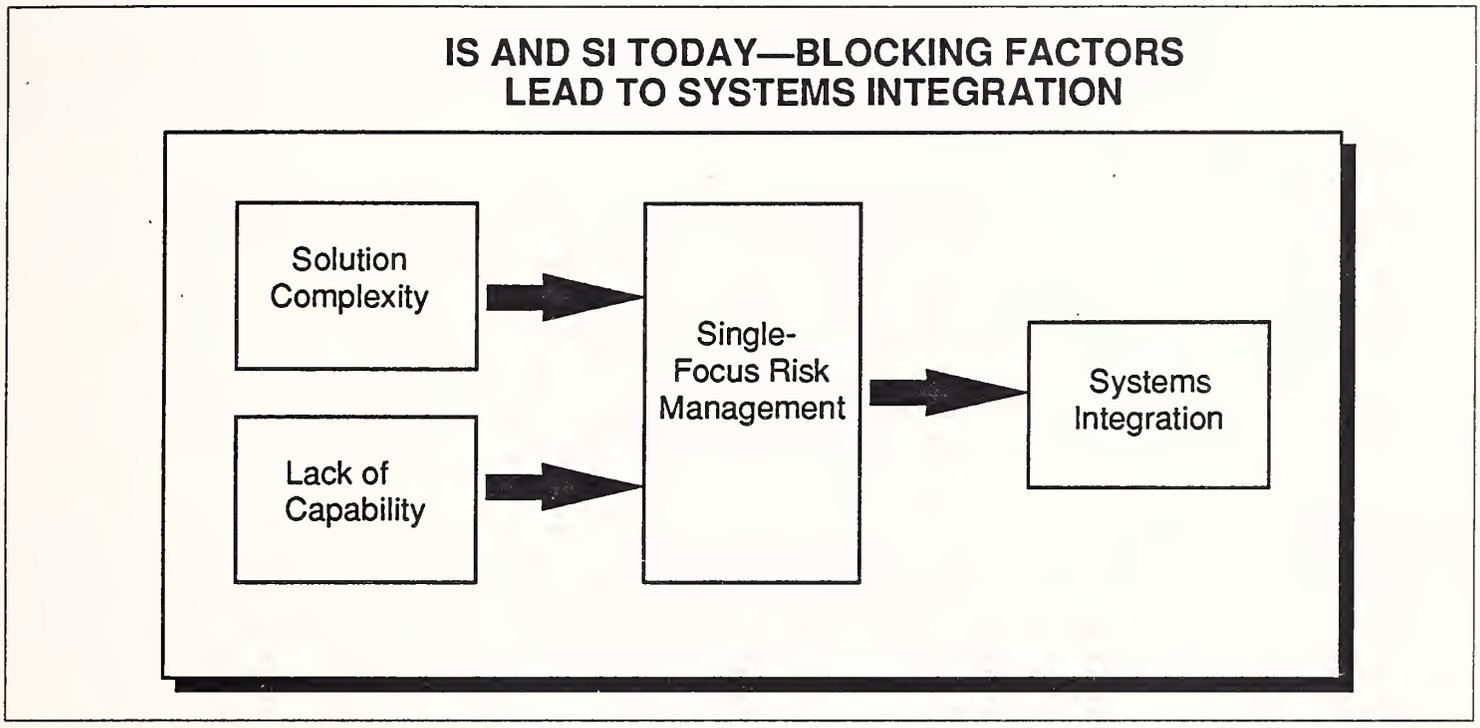
Area	Requirements
Integration	Applications/Data Technology
Management of IS	Productivity of IS Simplification of Support User-Managed Development
Mission-Critical Systems	Support the future versus the Current Situation

- IS's first priority is the integration of the existing information network. Emphasis on distributed processing and end-user computing has resulted in, at best, a loosely connected information network. Integration is the only means to control the network and to increase its effectiveness in meeting user day-to-day information needs.

- The second priority is effective management of the IS function. Pressure to operate IS on a bottom-line basis has been growing throughout the 1980s.

- Third is the current quest for mission-critical systems designed to improve the competitive posture of the business. As both the user and IS create such "systems," the challenge to implement them is often beyond both information systems and the users' capabilities. It is this priority that is leading to the use of systems integrators as depicted in Exhibit II-5.

EXHIBIT II-5



C

The Corporate Viewpoint

The corporate elements of the systems integration process as listed in Exhibit II-3 include rationale, financial implications, legal aspects, approval, and stewardship (as opposed to management) of the project.

As we have just seen, the rationale for using a systems integrator is being driven by complex systems designed to meet business needs and the ability of the business—in particular, the information systems function—to meet those business needs using the most advanced and appropriate information technology.

In its research, INPUT found the corporate viewpoint concerning these issues to be:

- Financial Implications
  - Given that most of the systems that result in a systems integration solution are large and complex, the corporate staff is addressing them like any major investment in plant, facilities, etc. The existing internal review and investment analysis processes and guidelines are employed.
- Legal Issues
  - Most buyers are taking the lead in the contractual interface using their contracts, not the vendors'.
  - At the same time this area has not proved to be of concern for either buyer or vendor.

- Project Approval
  - Final approval of an SI project typically follows selection of the vendor, which then plays a role in the final presentation and approval process.
  - Because of the complexity of most projects, they often take more than six months from inception to signed contract and full approval.
- Stewardship
  - Involvement declines after approval, and stewardship passes to the operating unit's management.

D Information Systems Issues

The buyer/vendor information systems issues—as listed in Exhibit II-3—primarily deal with the execution of the systems integration project and range from specification or definition to the broad communications and personnel aspects of implementing what is often a completely new approach to an existing business operation.

1. Project Definition and Acceptance Criteria

These two elements are related but best kept distinct in the initiation of the project. The parties that develop them are often the same, but experience has shown that the acceptance criteria activity should be performed separately and later in the process.

Organizations most often involved in the definition process are listed in Exhibit II-6. It is not surprising that the user middle management is the dominant group and often carries the true responsibility for this and subsequent phases of the project. It is also interesting to note that there are times when it is appropriate to include the customer in the definition process.

Other findings of note concerning these issues are:

- Do not overspecify the project, as this may restrict the creativity of the vendors in the bid process.
- The acceptance criteria are best developed after the vendor and approach have been selected. The acceptance process will vary with the technology and design of the system.

2. Selection Criteria and Bid Process

The buyer of a systems integrator's services has a number of expectations. The buyer is looking for help on problems of highest importance,

EXHIBIT II-6

INFORMATION SYSTEMS ISSUES— PROJECT DEFINITION PARTICIPATION

Group	Cases Represented (Percent)
Middle Management (DIR/MGR)	73
Information Systems	67
Upper Management	33
Outside Consultants	20
End Users	20
Customers	6

expecting a solution of significant creativity, and expecting rapid deployment of the solution. As a result buyers are not interested in an open bidding process, or in helping a vendor develop its expertise.

In selecting a systems integrator, primary importance is being placed on industry and application knowledge and proven experience (on-time, on-cost delivery), as shown in Exhibit II-7. The buyer will look for and will visit reference sites in the selection process.

3. Project Management and Communications

A truism of almost all systems integration projects is that they are complex and that they impact numerous departments and employees in the buyer's organization. It goes without saying that project management skills will be of critical importance.

But even more critical is the communication process that exists throughout the process of development, deployment, and support. A long-standing error in the systems development process has been the limited involvement of the systems user in the process. Most SI projects are countering this at the user management level, but without a special effort the true user can remain in the dark until it is too late to contribute.

EXHIBIT II-7

INFORMATION SYSTEMS ISSUES— VENDOR SELECTION CRITERIA

Type	Frequency of Use* (Percent)
Industry Experience	86
Application Knowledge	86
Cost/Performance	86
SI Experience	79
Project Management Skills	64
Support Skills	64
Service Orientation	50
On-Site Visits	43
References	43
Alliances	21

* Multiple responses permitted.

The most successful projects placed extra emphasis on the communications process and carefully managed the environmental and organizational impacts of the new system from the very start. **True success comes in implementation and use, not in creativity of design.**

E

The End-User Perspective

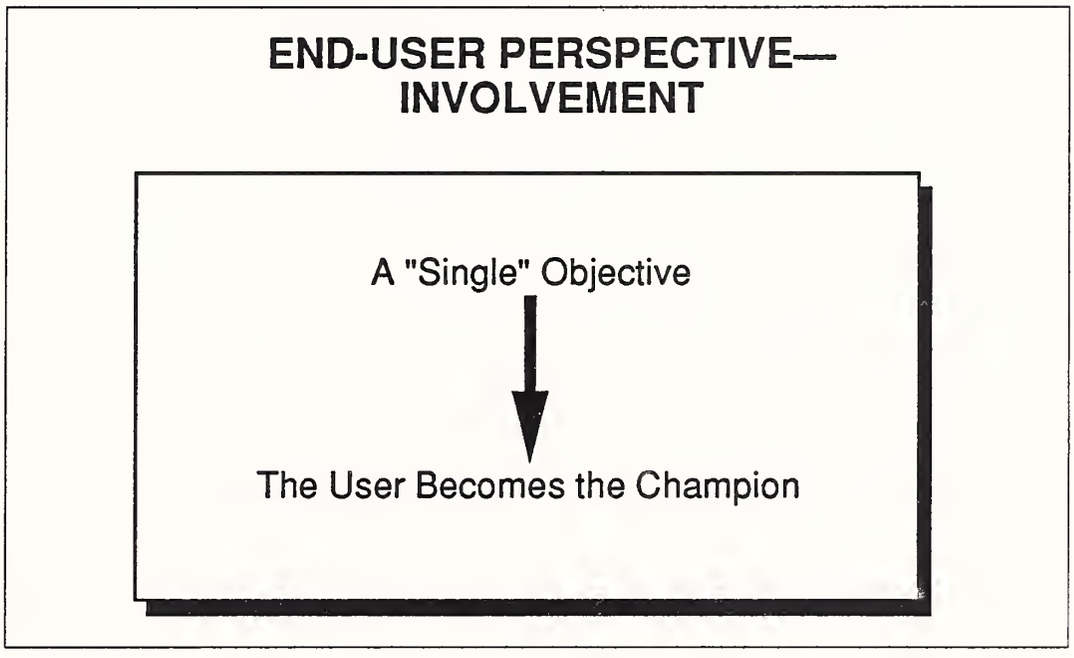
The end-user perspective comes at two levels. First, perspective comes at the management level, including definition and control. Second is at the operation level, which can range from senior professionals to blue-collar workers with limited exposure to information technology.

As already noted, the only way to ensure ownership by the operational user is to involve users in the process from the very first step. Often-valuable user suggestions should also be included in the system.

The other critical aspect is to assure that enough time is provided for the necessary training. Training is the easiest element to shortchange when deadlines begin to become a problem. It is the system integrator's responsibility to assure that these issues are included in the proposal and are fulfilled.

As Exhibit II-8 suggests, there is a guaranteed path to success.

EXHIBIT II-8



F

Conclusions and Recommendations

Exhibit II-9 provides a summary of the process elements evaluated relative to their importance to project success.

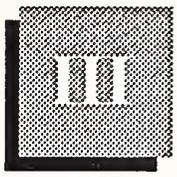
This exhibit reinforces the previous statements that concentrating on communications, involvement of the operational user, and the vendor selection process are the most important elements to the success of an SI project.

EXHIBIT II-9

PROJECT ANALYSIS OF ISSUES AND OVERALL SUCCESS

High	Medium	Low
Environ. & Org. Impact	Bid Process	Acceptance Model
User Perspective	Environ. & Org. Impact	Project Definition
Selection Criteria	Project Definition	Selection Criteria
Project Definition	User Perspective	Bid Process
Bid Process	Selection Criteria	Technology Review
Acceptance Model	Technology Review	Project Management
Project Management	Project Management	Environ. & Org. Impact
Technology Review	Acceptance Model	User Perspective

Information Technology—Today's Challenge



Information Technology—Today's Challenge

INPUT believes that one of the primary driving forces for systems integration in the commercial market is the immensity of the challenge facing today's information systems function. Certainly this has proven true in the federal systems integration market, which has preceded the commercial SI area by a few years.

The purpose of this chapter is to understand the forces and issues impacting information systems and the implications for the evolution of commercial systems integration.

The following top-down look draws on INPUT's ongoing research in the information systems community for INPUT's Information Systems Program. For a more in-depth report on this subject, the reader is referred to INPUT's *Annual Information Systems Planning Report.*

A The Environment

The challenge facing today's information systems management is more complex and taxing than ever before. Throughout the 1980s IS has been distributing processing development and control of the information management function throughout the organization. This distribution process has included:

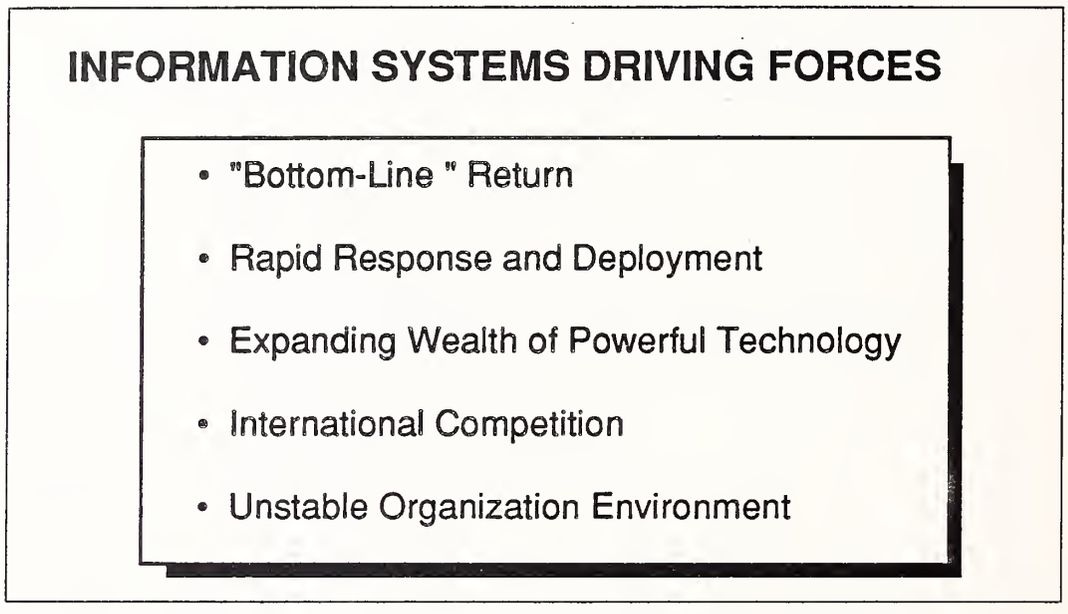
- Pushing activities down the network.
- Reluctantly opening some types of services to users.
- Chasing the PC and end-user computing explosion.

Today many information networks are dispersed and more accessible to the end user, but poorly integrated. The new challenge is to integrate the network and to increase its direct support of the strategic, versus operating, objectives of the business.

At the same time the role of information systems executives, in the eyes of senior management, has begun a major evolution. More and more industries and organizations are looking to information technology for a competitive edge. Competition is international, many organizations operate in an unstable organization environment, and deployment of new business solutions must be rapid and expansive.

Of all the forces driving industry today, INPUT finds that those listed in Exhibit III-1 are the most important to the information systems function and the successful application of information technology as we enter the 1990s.

EXHIBIT III-1



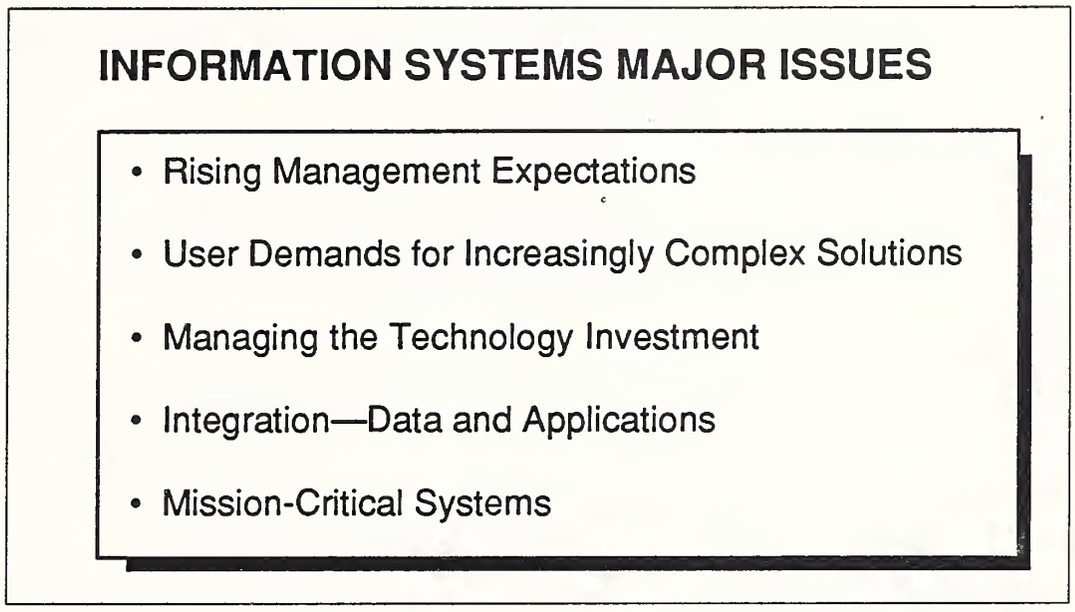
All of these forces are directly impacting the manner in which information systems are being developed and implemented. The job is increasingly more complex due to short lead times, the environments created by mergers/acquisitions, and the generally accelerated pace of business.

These driving forces, along with the generally distributed and inadequately integrated information network of today, create a specific and challenging set of issues for information systems management.

Exhibit III-2 lists the issues that INPUT believes are most critical to the central IS function successfully performing its role.

There is an increased demand, complexity, and criticality to the use of information technology today. Yet the typical IS organization is confronted with a number of blocking factors that must be overcome in order to respond in an effective manner. Given that many of the new requirements are network based, most IS shops find themselves with infrastructures that are in chaos. Lack of connectivity, incompatible processing capabilities, and data disarray are commonplace. Also working against

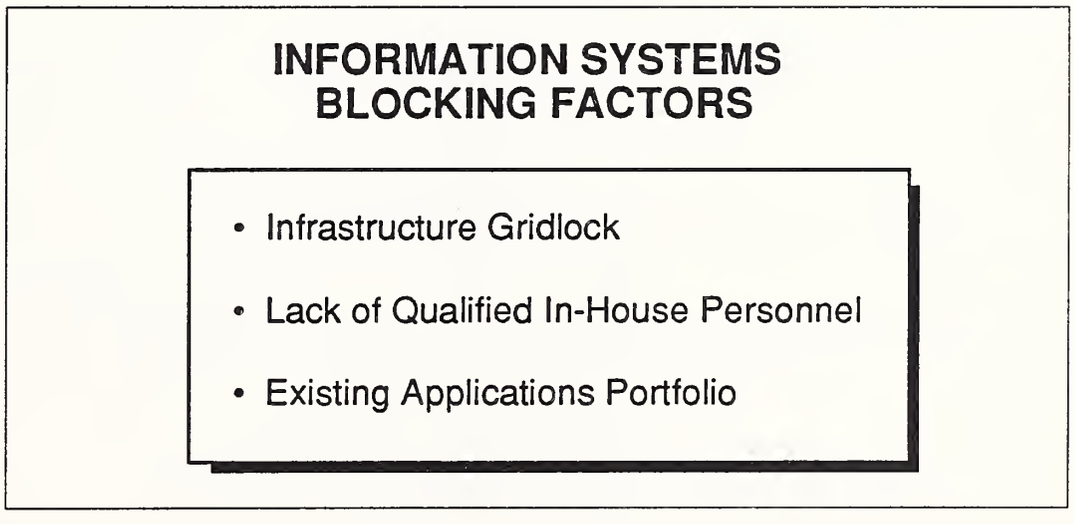
EXHIBIT III-2



IS's success are a lack of in-house capability and an aging applications portfolio that must be maintained for day-to-day survival.

The critical blocking factors are, as shown in Exhibit III-3:

EXHIBIT III-3



- **Infrastructure gridlock:** too many types of processing capabilities and standards that reduce control and restrict integration.
- **Lack of qualified in-house personnel:** after a number of years of tight spending, decentralization of staff, and expansion in the number of information technologies that must be supported, IS finds itself spread very thin and restricted in its ability to add staff.
- **Existing applications portfolio:** the first responsibility of IS is the day-to-day support of the existing applications. Operating the business must come first, and given the size of the portfolio developed over the past twenty years, this is an immense task.

This environment and its complexity all suggest a change in the focus and role of the corporate (central) IS function.

B

The Challenge

INPUT believes the primary challenge facing IS is to rise above its traditional responsibilities and role and to set a new focus and emphasis. Exhibit III-4 summarizes the three areas on which IS management must focus for the 1990s.

EXHIBIT II-4

INFORMATION SYSTEMS MANAGEMENT FOCUS

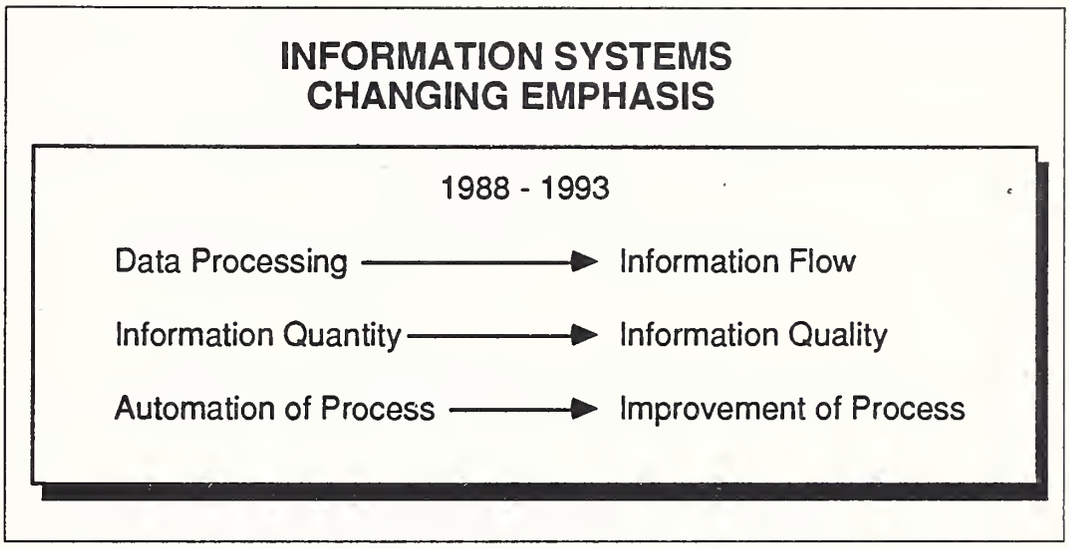
Area	Requirements
Integration	Applications/Data Technology
Management of IS	Productivity of IS Simplification of Support User-Managed Development
Mission-Critical Systems	Support the future versus the Current Situation

To meet this challenge, IS management must focus its energies on three essential missions: integration at a variety of levels; the management of the IS resource; and the identification, development, and support of mission-critical systems. These missions must take precedence over all others, with the exception of the existing applications portfolio, which cannot easily be handed off to the user.

Over the next few years a significant and broad change in emphasis is required by IS in the manner in which they view the use of technology. This change in emphasis is described in Exhibit III-5.

- Executive management is demanding that IS focus more on the information flows that are vital to remaining competitive, or are required to leap forward in strategy or product.
- The user is demanding that there be more quality and ease of use in the data and information in the network.
- Management is expecting IS to apply technology to improve existing processes or to invent totally new processes to support critical missions.

EXHIBIT III-5



Achieving these missions and changing emphasis will require additional development resources and new types of skills. Yet for the last two years INPUT's research has indicated that less than 40% of the internal staff is available for new development. INPUT's research further indicates that instead of expanding internal staff, IS is more often turning to outside resources to support new development requirements.

1988 research findings in Exhibits III-6 and III-7 support that conclusion.

- 37% of the resources will involve package software (Exhibit III-6).
- 43% of the new major projects involve a combination of internal and external resources (Exhibit III-7).
- Over half (52%) of the projects that involve a combination of resources also involve the use of package software (Exhibit III-7).

EXHIBIT III-6

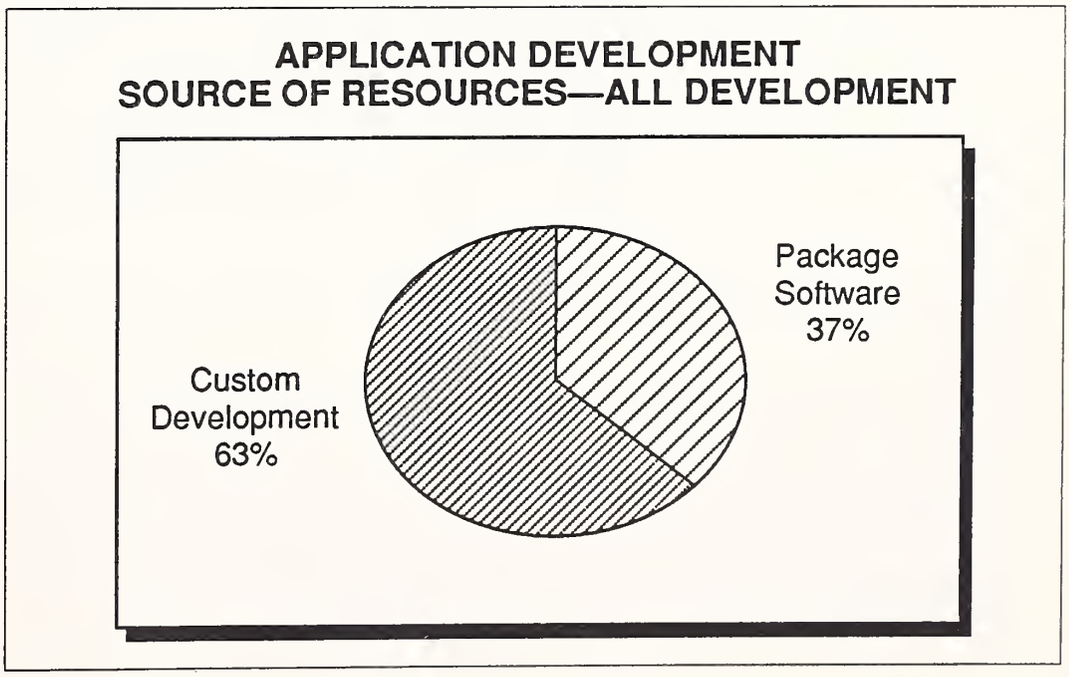


EXHIBIT III-7

APPLICATION DEVELOPMENT
SOURCE OF RESOURCES—MAJOR PROJECTS
(Percent)

Source of Resources	Package Software	Custom Development	TOTAL
Internal	22	78	56
Combined	52	48	43
External	100		1
TOTAL	35	65	100

The challenge is a major change in focus and emphasis.

C

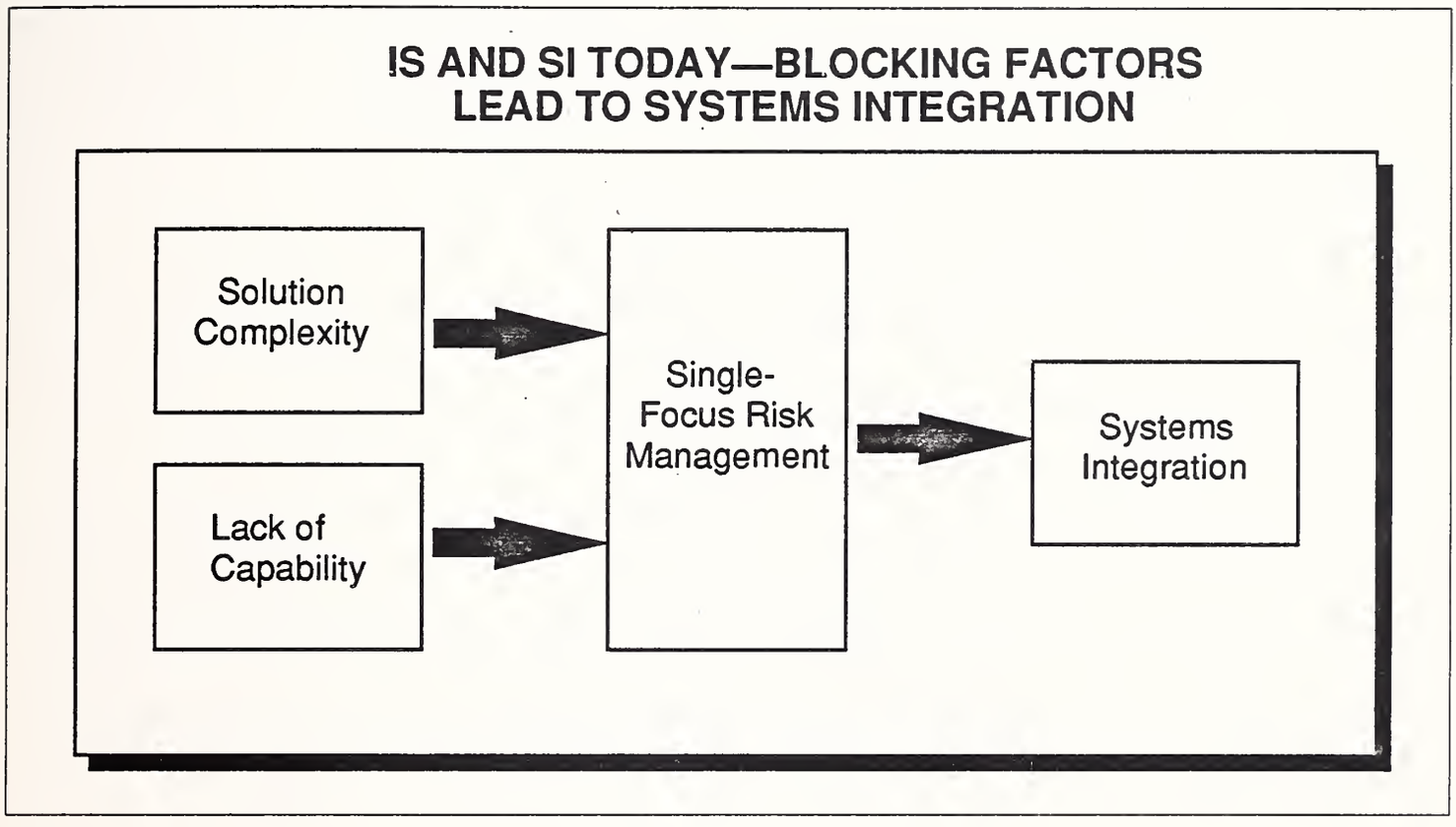
Information Systems and Systems Integration

The blocking factors in Exhibit III-3; the pressure for larger, more complex systems; and the overall challenge described in the last section are driving information systems as well as organizations in general to search for additional systems development strategies.

As noted, the use of external resources (most often in combination with internal development resources) and package software is on the rise. INPUT market forecasts clearly show that the professional services and software products markets are growing faster than the overall market and IS expenditure levels.

This search for assistance is driving information systems to consider the systems integration concept and to support its use as an alternative systems development strategy. As Exhibit III-8 shows, systems integration is a logical evolution; it can provide the internal information systems organization the time required to address the integration challenge. INPUT believes that the progressive senior IS executive will be a true supporter of systems integration in the near future.

EXHIBIT III-8



D

Information Systems Role

To complete this top-down look at the Information Systems challenge of today, it is necessary to describe the impact on the IS organization and forecast the role, responsibilities, and organization style required of IS in the 1990s.

INPUT believes that as the 1990s unfold the involvement of the user in the information systems process will expand greatly. The role of the end user will include:

- Controlling strategic information systems decisions
- Doing the majority of the application development
- Managing the processing at the distributed (minicomputer) and work-station levels
- Working from a broad base of computing experience

As users gain knowledge and control of the application development, they will begin to control the decisions on systems solutions. This change will surely impact the sourcing of those solutions and further open the door to external providers (systems integrators). This trend is already underway and is driving the CSI market

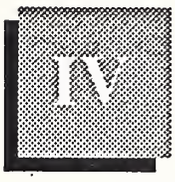
INPUT sees the role of IS shifting toward advising (versus operating) many of the information systems processes, being a consultant to the user (versus a developer), designing the architecture (versus the applications), and running the network (versus the processing points within the network). To fulfill this role, the responsibilities will become the following:

- Providing corporate strategic support
- Performing architecture engineering
- Doing application planning (versus application development)
- Managing the data architecture and core data base management
- Managing the network
- Managing the corporate processing, but not the distributed processing

As a result, the corporate IS organization of the 1990s will be smaller and expert based, with information engineers and solution builders working as consultants to users. IS will become the champion for information technology, while often only dealing with specific projects at arm's length.

Properly executed, this change in role, responsibilities, and organization structure will equip information systems to act like a systems integrator and to become an internal competitor to the CSI vendor community.

The Corporate Viewpoint



The Corporate Viewpoint

The assessment in Chapter III of the challenge facing information systems, and the changes taking place in the process by which major systems are developed and deployed, provide a background for a closer look at the buyer issues involved in the systems integration process. In this and the next two chapters we will look at buyer issues from the viewpoints of the three communities identified in Chapter I, Introduction.

A Introduction

In this chapter INPUT addresses the systems integration process through the eyes of the corporate community.

The value of the systems integration projects tracked as part of the INPUT Systems Integration Project Report Service and studied for this report averaged about $10 million. Activities of this scope and size usually require corporate review and approval. Corporate is looking for return on investment, response, and competitive advantage.

Referring back to Chapter III, driving forces and major issues of primary importance to corporate are:

- Driving Forces
  - Bottom-Line Management
  - Rapid Response and Deployment
- Major Issues
  - Rising Management Expectations
  - Mission-Critical Systems

The size of SI projects, their importance to the business, and the driving forces and major issues lead to the following "buyer issues" that are of principal concern to the corporate community. The remainder of this chapter reports the findings for each issue.

- Systems Integration Rationale and Process
- Financial Implications
- Legal Concerns
- Approval Process
- Stewardship Role

B

Systems Integration Rationale and Process

The initial question is why business enterprises engage outside systems integration companies. To answer this, we address two key elements: requirements and the ability of the internal organization to respond to the requirement.

1. Requirements

In every case examined, our research indicated there were obvious strategic requirements that became the driving force behind the project. Some examples follow:

- Manufacturing facilities had to be updated in order to remain competitive.
- Customer response time had to be improved, not only in the delivery of the product or service, but also with respect to the quality of information required in order to initiate the activity.
- Distribution centers had to be automated or updated and strategically relocated in accordance with changing customer demographics in order to reduce cost and improve service.

In the majority of the cases investigated, the project had a major impact on the company's business, and the idea originated at the highest levels of the organization.

2. Response Capability

INPUT identified two key findings relative to response capability.

- First, in all cases, the ability to focus on a solution resulted in a taskforce or a steering committee being formed to broadly define the

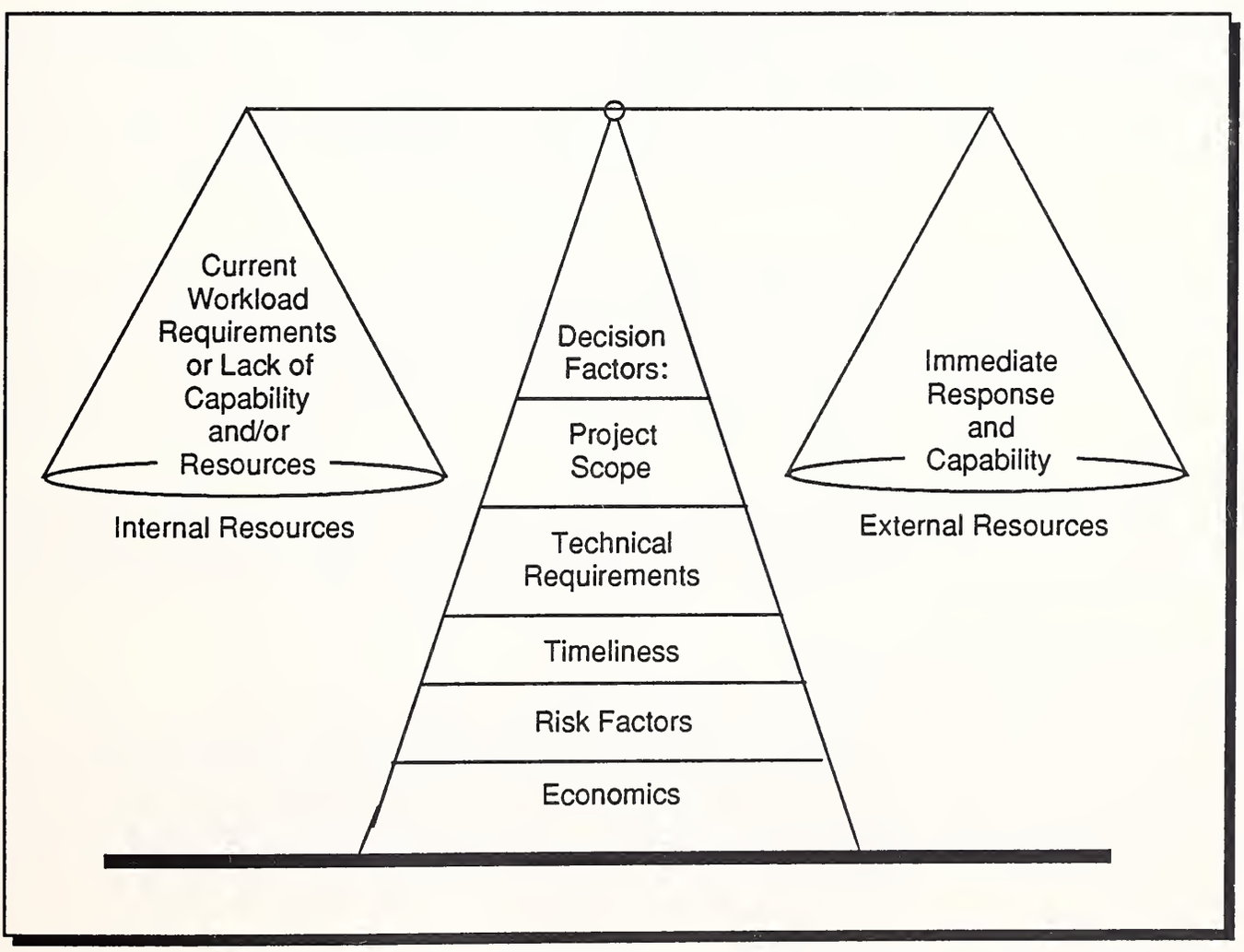
overall goals, objectives, risks, and benefits of the project. Members of these committees were usually senior individuals who possessed in-depth knowledge of the global aspects of the business. The user, possibly with outside support, is defining the often-complex solution and the response time required.

- Second, the capabilities required by the solution often outstripped the internal skills. Adding to the required new skills is the previously discussed restricted response capability of the IS function. Since the user at a very senior level has set the solution and the response requirements, IS management is having to indicate that it can only support (not execute) the project.

Decisions concerning the employment of internal or external resources were usually based on the scope, technical requirements, timeliness, risk factors, and economics associated with the project as outlined in Exhibit IV-1.

EXHIBIT IV-1

INTERNAL VS. EXTERNAL IMPLEMENTATION



In reviewing these activities, it became clear that when an outside systems integration company was retained, it was mainly due to the buyer's lack of internal capability and/or resources. There were cases when a complete or partial capability existed within the buyer's organization, but due to other considerations, such as current workload or not wanting to increase the professional staff, a systems integration vendor was retained.

C

Financial Implications

The financial implications of multimillion-dollar systems integration projects, although extremely important, did not appear to have serious effects on the buyer's estimation of whether or not the project would proceed. In most cases it was an issue of "we can't afford not to proceed if we want to remain competitive and profitable"; the benefits justify the investment.

Once a project gets classified at the strategic level, the financial implications are dealt with by the very top of the organization and are managed accordingly.

1. Funding

As with all major business development projects, the funding for the majority of these projects came from within the buyer (the eventual user), as opposed to from the corporate (information systems or other) organization. Funding includes significant capital as well as multiyear expense commitments and thus must be part of the user operating budgets.

The question was posed as to whether financing by a third party associated with a particular vendor could have major significance in the selection process. (The recent formation of the EDS/GMAC alliance was cited as an example.) Although many of the executives found the idea intriguing, there was no response indicating this would be a real advantage.

For the most part, systems integration projects are funded through the corporation's own processes, and having the systems integrator (through an alliance) fund the project could have negative connotations.

2. ROI

Return on Investment (ROI) numbers in many cases were highly proprietary and it was difficult to gather meaningful data. Three- to five-year payback periods were common. Large corporations have established internal processes for the financial analysis of major projects. It can be assumed that the existing process and guidelines would apply to systems integration projects as well.

It became apparent that far more important than ROI was the impact of the project on the bottom line.

The project is strategic in nature and fundamental to the company's (or operating unit's) future direction; thus the financial analysis and related implications are only one of the final-decision criteria.

D

Legal Concerns

1. Contract Negotiations

Contract negotiations, by their very nature, can be a time-consuming and laborious task. When the contract involves an activity with high risk and dollar value, the challenges become even greater.

Our research indicated, however, that this was not necessarily the case. From the companies interviewed, it appeared the negotiation process was both uneventful and, in the majority of cases, completed in a timely and efficient manner. There was not a single case where the contract negotiations were described as difficult.

The core documents used to develop the final contract, for the most part, were supplied by the *buyer* as opposed to the vendor. In many instances, the buyer insisted on using its contract. In all the cases surveyed, the contract was modified or enhanced through negotiations with the systems integration company.

2. Performance Bonds

There was not one instance of a performance bond being required. In most cases, the schedule of payments was based on attainment of major milestones that resulted in deliverables of a measurable and tangible nature.

E

Project Approval

The approval process varied depending on the size and scope of the project. If a board of directors' approval was required, it usually involved the total project, with sign-off authority being delegated to those responsible for each individual element.

In the majority of cases, a representative of the prime vendor was present when the project was presented for approval. In some cases the vendor representatives actually participated in the overall presentation and in other instances played a supporting role, answering questions of a technical or performance nature. Approvals were always granted and any delays (which were minimal) were attributed to the need for additional information or further clarification.

The average time frames involved for this phase—from the formation of the taskforce through the signing of the contract—are noted in Exhibit IV-2. The length of time can be directly attributed to the complexity of the project and the respective detail specification process required to assure that results meet expectations. This topic is covered in more detail in the next chapter.

EXHIBIT IV-2

TIMEFRAMES* INVOLVING SI PROJECTS

Period	Respondents (Percent)
6 Months	30
7–12 Months	50
>12 Months	20

* From Inception of the Taskforce to a Signed Contract

F

Stewardship Role

The extent of ongoing involvement of the corporate staff varied from project to project. In all cases an in-place mechanism, either formal or informal, was used to advise senior management of the status of the project.

Formal project review meetings were routinely used to control the project and, in many instances, the corporate staff was asked to attend. Attendance varied by project.

Projects that involved special hardware components, such as various material-handling devices, were often reviewed by senior management on an informal walk-through basis.

As would be expected, once a project was approved by senior management, their involvement declined to that required to maintain an awareness of progress. Given the multiyear aspect of many projects, it may be a number of years until results are measurable.

The dissemination of project status information is discussed in further detail in the Project Management Section of Chapter V.

G
Summary

The key findings from the corporate point-of-view are:

- Systems Integration projects typically represent programs of major strategic importance. Therefore, they are defined and approved by senior user and corporate management.

- By the nature of SI projects, and due to the extent of existing demands on the information systems function, the decision to use a systems integrator is commonly made by the corporation or business unit, not by information systems.

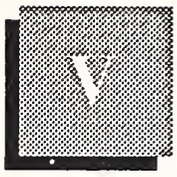
- Financial assessment and support of systems integration projects is commonly handled like any other major investment in capabilities—that is, by using established internal financial processes.

- Contract negotiations and management of the liability and risks factors did not pose an obstacle to the projects studied. The contract used was often the buyer's, not the systems integrator's.

- The initial phase of a project, from inception through a signed contract with the vendor, routinely takes more than six months and can take years.

- The involvement of the corporate community declines once the contract is signed. However, keeping corporate staff aware of progress is obviously prudent.

Information Systems—Role and Issues



Information Systems—Role and Issues

In Chapter IV we reviewed, from a corporate viewpoint, the Systems Integration rationale, financial implications, legal concerns, and approval process when engaging an outside Systems Integration company.

A Introduction

In this chapter we will look at the systems integration buyer issues from the information systems point-of-view. There are three aspects to consider within the information systems topic.

- The technical/computer elements of the project, ranging from systems specification to the selection of the underlying hardware and software technology, to the integration of the new system with the established network.
- The systems integration process and its complex project management process that brings together external and internal professionals.
- The role and degree of participation of the central information systems organization in an systems integration project.

All are addressed in this chapter.

Referring back to Chapter III, the driving forces and major issues most directly impacting the information systems portion of the systems integration process are the following:

- Driving Forces
  - Rapid Response and Deployment
  - Expanding Wealth of Powerful Technology

- Major Issues

  - User Demands for Increasingly Complex Solutions
  - Managing the Technology Investment
  - Integration—Data and Applications

These factors lead to the following "buyer issues" that are of importance to the information systems community and process.

- Project Definition Process
- Acceptance Model Considerations
- Selection Criteria
- Bid Process
- Project/Technology Review
- Project Management Issues
- Environmental & Organizational Issues
- Information Systems—the Internal Competitor

The remainder of this chapter reports the findings on each of these issues.

B

Project Definition Process

The project definition and system specification process is one of the most difficult areas for a buyer considering a large systems integration project. The goal is to define, from a functional and performance viewpoint, the detailed characteristics of the desired systems solution. This definition can be extremely difficult if the challenge involves the use of new technology, including both hardware and software. At the same time the structure of the specification can greatly influence the external vendors that will be bidding on the system.

1. Group Profile

Our research showed that in all cases, once the decision was made to proceed beyond the conceptual stage, a project team of a functional/technical nature was formed and chartered with developing the project definition and system specification.

The makeup of this group, as reported in Exhibit V-1, consisted mainly of middle management from the user organization and information systems professionals, although in 33% of these committees, the traditional IS group was *not* represented. Another 20% of the projects involved an outside consultant, but there was *no* correlation between the lack of IS participation and the retention of outside consulting services.

EXHIBIT V-1

INFORMATION SYSTEMS ISSUES— PROJECT DEFINITION PARTICIPATION

Group	Cases Represented (Percent)
Middle Management (DIR/MGR)	73
Information Systems	67
Upper Management	33
Outside Consultants	20
End Users	20
Customers	6

It was also interesting to note that the end users, who interface with the system on a daily basis (versus their management), had only a 20% representation in this definition process, although in 6% of the cases the buyer's customers were represented in these committees due to the strategic nature of the project.

2. Level of Detail

For the most part, the level of detail in the specification was extremely high. In one case, there were over 400 points that dealt with functionality and performance. As a rule, more time was spent on functionality issues as opposed to performance, which resulted in other ramifications as outlined in the acceptance criteria section of this report.

In some cases the project management indicated that it had purposely avoided extensive detail in the definition phase. They were concerned that by overdefining the system the vendors might be restricted in the creativity of their proposals. To paraphrase one interviewee: one of the things we are paying for is the experience and creativity of the systems integrator; therefore, do not restrict the systems integrator's response.

INPUT's view is that the level of detail must be adequate to feel comfortable in evaluating the proposals; should emphasize function, environment and performance; and should avoid overdefining the technological aspects of the proposed system.

The lines of communication, initiated by the RFP process, are important to the overall success of the project.

3. Review

The review process of the completed specification in most cases did not go beyond the committee itself. Once the group was satisfied it had achieved its goals, the document was approved through consensus and attention focused on other issues.

The development of the specification, as shown in Exhibit V-2, varied in time from six months to over three years. There was *no* correlation between the amount of time spent on this process and the overall success of the project.

EXHIBIT V-2

DURATION OF PROJECT DEFINITION PHASE

Period	Respondents (Percent)
<6 Months	27
6-12 Months	27
12-24 Months	33
24-36 Months	13

4. Buyer Quotes and Comments

The following quotes and comments from the research interviews reinforce the findings just described.

- Second most important part of project, and we should have had end-users as a part of the team. (The tendency too often is to have the definition performed by management, excluding those who later have to operate the system. This has been a long-standing shortcoming in the systems development process, and it is not surprising that user management would make the same mistake.)

- Not enough literature available on existing systems. (This may unfortunately indicate a desire for too much detail and in turn restrict the vendor's proposal.)

- When users were involved from the beginning, the steering committee got too much information. They had to pare down to a workable level.
- When a brief project specification was used, the final specification was formed with the users and the vendor.
- Very loose specifications on-purpose to encourage vendor ingenuity.

C

Acceptance Criteria

INPUT's research team was very surprised when the survey results showed how little emphasis was placed on this issue. Only 53% of the companies surveyed considered the development of test criteria a phase in itself. Of that percentage, half felt they should have addressed this issue far more strenuously. Respondents indicated that part of the problem lies in the technology and scope of these projects, making it extremely difficult to create acceptance criteria in an efficient and effective manner.

The implications of inadequate or a total lack of acceptance criteria are a major issue and potential exposure for the systems integrator. INPUT would suggest that intelligent acceptance criteria, defined by the buyer and, when appropriate, with the vendor, are a form of insurance for the system integrator.

1. Scope/Process

Where there was a detailed set of criteria, it was usually generated as part of the specification process. However, there were cases where once a vendor was selected, both parties cooperated in developing the acceptance criteria, which then became part of the overall contract.

In most cases, the parties involved in defining acceptance criteria in this process included the same members of the taskforce chartered with developing the project specification. Of the companies interviewed, 40% did not establish acceptance criteria at all, whereas the other 60% identified the various modes as outlined in Exhibit V-3.

2. Methods of Testing

- *Performance criteria* - Wherever practical or feasible, performance criteria were considered as an option, but as can be appreciated, large, complex systems integration activities, in and of their own complexities, can make this a formidable task. This approach, however, was found to be the one most widely used.
- *Functionality* - as defined in the project specification, functionality was also used as a test method in accepting a system.

EXHIBIT V-3

ACCEPTANCE METHODOLOGIES

Type	Respondents (Percent)
Performance Criteria	40
Functionality Definition	26
Simulation	13
Prototype	7
Parallel Processing	7
Unknown	7

- *Simulation* - Simulation was used as a form of predicting acceptance prior to implementation. This simulation was either performed by the vendor or an outside third-party company retained only for this purpose.

- *Prototyping* - Where crucial subsets of a process could be isolated, that portion of the system would be prototyped. For example, in an on-line retail system, the functionality associated with the point-of-sale equipment and the required response times was prototyped.

- *Running parallel* - In the case of a project that involved the replacement of an existing process with new technology or enhancements to the present functionality, parallel testing was used as an acceptance method.

In most instances those interviewed were not able to specify the length of time required to develop acceptance criteria. For those that did respond, the time spent developing the acceptance criteria was either not known or fewer than six months, as shown in Exhibit V-4. As was the case with the project definition process, there was no correlation between the depth of detail (or the length of time spent developing the test criteria) and the overall success of the project.

EXHIBIT V-4

DURATION OF ACCEPTANCE PHASE

Period	Respondents (Percent)
<6 Months	27
6-12 Months	7
Unknown	66

There is no doubt the specification and test criteria activities were closely related and inter-dependent. In one case, considerable detail was produced concerning both these issues, but overall the project suffered major setbacks. Setbacks were due to the constant changes that were allowed to take place during the implementation phase and resulted in the invalidation of the original specification and acceptance criteria.

Systems integration projects are by their nature living projects. Change must be considered part of the environment, and the definition and acceptance criteria must change with the objectives and the design.

Whenever there were problems with the acceptance criteria or the system not performing up to the expectations of the client, the buyers seemed to believe that the problems could have been avoided by a more stringent RFP.

3. Buyer Quotes and Comments:

Individual quotes and comments included:

- Acceptance model developed as part of final contract.
- Should have had more-detailed RFP. (Perhaps better project management of the evolving specification would have met the need.)
- Simulation results were questionable; should have done more testing. (The findings against the acceptance criteria were apparently ignored.)
- Acceptance model turned up many bugs; should have had a tighter RFP and specifications. (The acceptance criteria were doing what they were designed to do.)

- Acceptance model concurrent with RFP; should have been more concerned with details.

- More-specific test requirements to avoid problems later; should have been more specific in the RFP.

INPUT's overall reading of the acceptance criteria issue and process is that it receives too little attention by both buyer and vendor. It is hard to do and easy to avoid.

D
Bid Process

INPUT's research showed the bid process in the Commercial Systems Integration marketplace to be quite different from the approach used within the federal government.

1. Participants

Of the buyers polled, 80% determined beforehand which outside systems integration companies would be invited to bid on the project. Vendors were identified by talking to other companies involved in major projects, scanning literature and advertisements, and talking to vendors attending conferences and trade shows. The remaining 20% used an open bidding process and welcomed all outside Systems Integration companies interested in pursuing the business.

2. Bidder Conferences

Bidder conferences were held in 40% of the cases studied, whereas the remaining 60% scheduled individual meetings with the various vendors. As a result of these conferences or individual meetings, 20% of the companies modified or enhanced their original specifications.

In most cases when the bid was closed, the buyer invested considerable time in prescreening the various vendors' capabilities and expertise. The buyers did register a concern regarding the lack of vendor information that outlined the various systems integration services and capabilities. One buyer stated that the open bid concept was a waste of time. Most of the vendors attending were more "curious" than "serious," and only a few responded with proposals. Given the investment required by buyer and vendor in bidding a systems integration project, prudent management says to involve only vendors that appear to have, at least, adequate capabilities for the specific project.

Overall the majority of the firms rated the success of this particular activity relatively high. The approach used for bidding and the benefits received, as indicated by the respondents, were both productive and useful.

3. Buyer Quotes and Comments

- Good homework; prescreening took 5 months and paid off.
- Worked out well; all capable companies.
- Unnecessary to involve non-SI companies.
- Couldn't have gotten a better supplier.
- Meeting minutes clarified RFP.
- At vendor's conference, six changes to RFP made by Addendum.
- Conference resulted in changes in scope before the contract was signed.
- Process was very beneficial and a good learning experience.

E

Selection Criteria

Somewhat surprisingly, the research findings indicate there was no pattern in determining the chosen vendor. Instead, a combination of approaches was used and in some cases considerable thought was *not* given to this issue until the vendors bidding the project had submitted their proposals.

The most common approach was the overall evaluation of how the vendor proposal measured up to the buyer specification, but in addition there were numerous other criteria identified as having major significance in the selection process. It was interesting to note that in only 30% of the cases did the buyer group responsible for selecting the vendor truly utilize the expertise of information systems.

1. Criteria Used

As listed in Exhibit V-5, industry experience, application knowledge, and cost/performance criteria were ranked the three most important issues when selecting a systems integration vendor. Alliances, widely reported in the press as being very important, ranked last. However, this poor ranking could be due to the transparent nature of the alliance participants from the viewpoint of the buyer organizations.

Other characteristics that were reported as being important by the buyers included the financial health of the proposed vendor, the expertise and stability of the proposed project management team, a knowledgeable and professional technical staff, and finally, vendors that are concerned with providing the "best" solution, as opposed to promoting established products and capabilities.

In one particular case, a vendor responded with a unique approach as compared to that outlined in the RFP. The advantages and additional capabilities that derived from the particular proposed methodology resulted in the award of the contract.

EXHIBIT V-5

VENDOR SELECTION CRITERIA

Type	Frequency of Use* (Percent)
Industry Experience	86
Application Knowledge	86
Cost/Performance	86
SI Experience	79
Project Management Skills	64
Support Skills	64
Service Orientation	50
On-Site Visits	43
References	43
Alliances	21

* Multiple responses permitted.

2. References

The two companies that registered the highest degree of satisfaction concerning the overall success of the project relied heavily upon references and on-site visits to similar installations. Many of the other companies interviewed also used references and on-site visits as a means of establishing vendor credibility. When considering the general lack of industry information available, as reported by the buyers from a vendor and project viewpoint, on-site visits and reference checks became a critical means of validating a particular vendor's claims.

3. Selection Time

The vendor selection phase ranged from fewer than 6 months to 18 months in length, as outlined in Exhibit V-6.

EXHIBIT V-6

DURATION OF VENDOR SELECTION PHASE

Period	Responses (Percent)
<6 Months	54
6-12 Months	20
12-18 Months	13
Unknown	13

4. Buyer Quotes and Comments

- Evaluate customer support.
- Look for stability in project management; try to research the proposed project manager as well as the company (an area of frequent complaint during project implementation).
- Could have used a more structured approach.
- Should have had better definition of requirements.
- Better understanding of vendor before site visits.
- Important to look at marketplace, do a good study, and be objective when choosing proposed architecture and vendor.

F

Technology Review

In the technology review the buyer assesses the underlying technology proposed by the systems integrator. That review may or may not involve external resources and commonly involves the internal information systems organization.

1. Types of Evaluation

The research showed this review process was considered by most buyers to be a subset of the vendor selection criteria. To establish the effectiveness of a proposed technology, 73% of the buyers used references and on-site visits with other companies in the same industry that had already employed an automated solution.Technology Review

The research indicated 53% of the companies also performed an internal technology review, and 13% retained an outside consultant to assist in this effort. Most companies sought to minimize risk by using proven, off-the-shelf technologies. (It must be recognized that this might restrict the proposed solution.)

2. Buyer Quotes and Comments

- Do site visits.
- Use all proven, off-the-shelf technologies—therefore, no risk is involved in that aspect.
- Look at vendor capabilities, communications, software development, and other projects that have been completed.
- Should have paid attention to AGV technology (robotics).
- Minor risk by specifying an older computer.
- This phase was part of vendor evaluation.
- Needed more time.
- Since review was done by references, there wasn't really anything done by the in-house staff.
- When investing this much time and money into a project, we should have looked at newer generation technology—go for the very top end.
- The system is not perfect, but it's working.
- Speed and expectations attained; questionable throughput.
- Look at successful previous experience in providing workable/doable solutions.

G Project Management

INPUT would suggest that project management in the end is the most important element to the success of an SI project.

Although one of INPUT's qualifiers for this report stated, "The systems integrator must be an outside organization and commit to total responsibility for the project," our research indicated the vendor's project management team was not always controlling the project.

The most confusing aspect of the interviews was the identification of whose project manager was in control. Of buyers polled, 40% stated the

vendor's project management team was in control of the project. An additional 40% indicated the buyer's project management personnel were really coordinating the overall activity. The remaining 20% indicated it was a joint responsibility and venture.

Who was the real project manager may not be important as long as the relationships are sound and management is involved in the review process. It is essential that the systems integrator's role and responsibilities are exceptionally clear and that they are in control of the subcontractors, if any exist.

1. Review Meetings

Project review meetings were held at different intervals, as noted in Exhibit V-7. Monthly meetings were the most popular, followed by weekly and quarterly. Meeting summaries were published both electronically and in printed form. In 80% of the cases, it was reported that the corporate staff was kept informed on a regular basis. In 66% of the cases, the project status information was released to individuals not directly related to the activity.

EXHIBIT V-7

FREQUENCY OF PROJECT MANAGEMENT REVIEWS

Period	Responses (Percent)
Monthly	40
Weekly	27
Quarterly	13
Daily	7
Milestones	7
Informal	6

2. Continuity

The one issue that appeared most critical had to do with the continuity of vendor project management personnel. It was reported that competent project managers were reassigned before a system was completed. In

several cases, the project manager was removed at the request of the buyer due to a lack of industry knowledge and systems integration experience. Several buyers stated that if they engaged a systems integration company in the future, they would *contractually* require that the vendor maintain mutually agreeable project management personnel throughout the implementation cycle.

3. Buyer Quotes and Comments

- Meetings became more frequent the closer they got to completion.
- Communicate with end users.
- *One* project manager for the life of the project.
- Document every change.
- Spent a lot of time with vendor—always knew status.
- Get end users more involved from the beginning.
- Need better communication between user and vendor.
- Need better definition of requirements.
- If we were to do this again, we'd do it all in-house.
- Vendor was middleman with lots of red tape. We had to constantly go around them to get work done. Vendor had to guarantee the services provided from the subcontractors should the subcontractor go bankrupt.
- Need full-time third party for software issues and evaluation.
- More frequent communication between corporate and user involvement.
- Status of project reviewed by independent QA partner every quarter.

H

Environmental and Organizational Impact

The typical SI project brings significant numbers of outside professionals in contact with all levels of the buying organization. This commingling opens the internal organization to morale and distrust issues that cannot be ignored. As the quotes and comments that follow indicate, the systems integrator and its staff is exposed at every turn. The expectations of the buyer relative to the vendor and subcontractor staffs are very high, and any weakness quickly opens the vendor to criticism.

1. Facilities

Large complex systems requiring additional staff will usually have an impact on equipment and facilities. Our research indicated that in 80% of the cases the buyer supplied office space and equipment for the vendor's personnel. In the remaining 20% of the cases, the systems integration company had to provide its own facilities and supporting equipment.

2. Communications

Communication between the two staffs was rarely done on a direct basis; instead, the project management team was used as the liaison between the groups. The commingling of buyer and vendor professional staffs, when it occurred, did not present serious problems. In 30% of the cases, however, issues were raised that included poor communication and vendor performance as perceived by the buyer's professional staff. These issues were often generated by concern about possible job eliminations.

Cases were also reported where it was believed that the buyer's in-house staff turned out to be more knowledgeable than the vendor's regarding the proposed system. These same buyers became disenchanted when, in their view, the vendor produced less than quality work and began to miss deadlines.

3. Buyer Quotes and Comments

If there is a single message in this lengthy list of quotes and comments, it is that the interchanges between vendor and buyer staffs must be managed with great care:

- Don't think anything can be done to make internal people more comfortable.
- Militant union—good communication saved the project.
- More user ownership of system.
- Users went through distrust, and were fearful of job security. One-on-one training helped.
- Management involved only if contractual issues.
- Liaison should be at original spec definition meeting to better understand project requirements.
- Vendor's standards not as high as buyer's.
- Sloppy contract—should have written tighter specs.

- Next time, we'll do it in-house, and the deliverables must be pretested.
- Project used as a training ground for vendor's people.
- Vendor needs to balance rookies with experienced people.
- Need same team from start to finish.
- We welcomed the vendor with open arms—no animosity. We realized that we needed these people and everyone here knows that.
- The vendor representative resigned, so now they're trying to find someone new who knows enough to take over.
- Buyer management constraints placed on project were more severe than ever before.
- Extreme discipline required for this project.
- Couldn't have done project without constraints and pressure; everything is positive.
- Animosity was directed at project manager due to pressure, but they still respected him and got the work done.

In more than one instance the comment was made that the internal IS professional knew more about the industry and the task at hand than the SI staff members. Where true, the systems integrator is exposed. It behooves the vendor to assess the individuals of the internal team and be sure the vendor's staff matches them one-for-one in the critical skill areas.

I Summary

In this chapter we have dealt with many of the steps of moving a systems integration project from the approval stage to the early phases of development and implementation. Some summary comments follow.

- The Project Definition Process that proceeds the involvement of the systems integrator is key to generating creativity from the vendor. Overdefining the original specification may restrict the quality of the bids.
- Increased emphasis is appropriate in setting acceptance criteria, and it is believed it is prudent to include the vendor in this process.
- The selection of a systems integrator is a multifaceted process. The best success seems to come through careful reference checking, an emphasis on previous experience in the particular area of the project, and verification of project management capabilities.

- There are many more companies claiming to be systems integrators than those that truly are. The buyer cannot afford to deal with those that are not serious or adequately equipped. As a result, buyers are likely to restrict the bid list and use a closed-bid process.

- INPUT has a concern that inadequate importance may be placed in the technological aspects of a bid.

  - This inadequacy can result from a specification that limits the technical flexibility of the proposal, thus limiting the vendor's creativity and inappropriately reducing the importance of the technological aspects of the proposal.

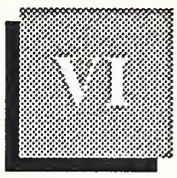
  - Inadequate emphasis can also happen because the internal project leader does not involve the appropriate information systems organization adequately.

- The quality of the projects results rests primarily with the ability of the systems integrator to "manage" the project. INPUT recommends that the buyer demand strong continuity of the vendor's management team. If weaknesses appear in the project management process, these weaknesses should be considered *the smoke that indicates a fire.*

- Communications capabilities and the depth of the technical skill levels of the vendor's staff become very important in the detailed phases of an SI project. The buyer company does not want to learn that it is the training ground for the vendor's staff.

- The internal information systems organization plays a multifaceted role in many systems integration projects and is critical to some. At the same time the IS organization lurks in the background as a potential competitor. The systems integrator needs the internal IS organization's cooperation and should seek it.

The End-User Perspective



The End-User Perspective

In this chapter INPUT looks at the perspective of the end user of the system that results from a systems integration project. The end-user community, as defined for this report, is those that operate and support the system in its day-to-day use. They may include the user management that help to conceive the system, but the emphasis is on the operational view. The end user operates the existing system and will operate the resulting system.

A Introduction

The involvement of the end user in the systems development process has been a long and slow evolution. Even though it is common today to include user management (often in a leadership role), it remains common to leave the *real user* out of the design process. The result is of course change, change, and more change following initial implementation.

The driving forces and major issues that most directly relate to the end-user area of SI projects are:

- Driving Forces
  - Bottom-Line Management
- Major Issues
  - User Demands for Increasingly More Complex Solutions
  - Integration—Data and Applications

As the user community demands and creates increasingly complex systems environments, they also inherit responsibility to make these systems work successfully. No longer can they "blame it on the computer."

When addressing SI research from this viewpoint, INPUT's findings reinforce a systems development principle that has taken a long time to learn—**involve the user at the lowest level in the design from the first step.**

B Involvement

The research showed a very important element to be the buyer's employees who relate to the system on a daily basis. Their attitudes, enthusiasm, and commitment concerning the effectiveness of the employed technology—and whether it is helpful, productive, and improves their environment—can have a dramatic effect on the success of a system. It is this community that can and will be the most vocal in evaluating the system.

The psychology of dealing with end users is extremely difficult because the skill sets can range from nil to pseudo-experts. Interfacing with uninformed end users can be a frustrating experience for both the buyer's and vendor's technical personnel. It is, however, an area that should receive considerable detail and attention; otherwise the probability of overall success is significantly reduced.

The research indicated that in 52% of the case studies, the end users were engaged to some degree in the planning, definition, and evaluation of the system. In addition, 50% of the companies surveyed indicated the end users should have been more involved earlier in the project. Had there been more user interaction, it most certainly would have resulted in fewer changes and rework. The user involvement that did occur concentrated on the user interface that would impact directly on the daily routine and associated productivity. Dialog and suggestions in many of the cases were not only welcomed, but encouraged.

- One case study involved the creation of a fully automated system that would replace a manual operation and caused considerable apprehension in a highly unionized workforce. Through site visits and other forms of orientation regarding the proposed system, apprehension was reduced and the end users became proponents of the new system.

- In another case, key workforce employees were selected and appointed as systems administrators. These individuals actively participated with the vendor's technical staff in gaining an appreciation and understanding of the proposed technology, including on-site visits to other companies that had an automated solution. This in turn lead to the systems administrators becoming firm supporters and promoters of the project in their capacity as liaison with the end-user community.

- In several cases, the buyer's customers were the "end-users" and participated on an active basis throughout the implementation of the system.

The research revealed that end-users who are not computer literate can and did offer developers advice that had a very positive effect on the ease of use and friendliness of the system and often supported changing the process versus just automating it. In several cases, this advice required more work on the developer's part, but overall most agreed that the changes were well worth the additional effort. This joint cooperation also resulted in improved end-user morale.

C

Training

The training and education presented to the buyer/user organization by the systems integration companies received very high marks. The techniques, and various modes of delivery as outlined in Exhibit VI-1, proved to be both effective and stimulating.

EXHIBIT VI-1

TRAINING TECHNIQUES EMPLOYED

Items mentioned as being effective:

- One-on-one.
- Custom training manuals
- Formal training classes for small groups
- User representatives receiving formal training in order to train their co-workers
- Paralleling the new system with the existing system eased the transition into a computerized integrated system

Hands-on training on the actual system was the most preferred method, with detailed customized manuals at every station as a backup and reference to the training received. Another effective method was to train a small number of personnel in each area who were then responsible for training co-workers. Using the train-the-trainer approach transfers the motivation and the responsibility directly to the end user and enhances the success level.

D

Summary

The ultimate test of any systems development project comes a number of months after initial implementation: is the system well received, operating to specification, and are those directly impacted by the system strong supporters?

INPUT believes that the systems integrator can contribute directly to this measure of success by helping the buyer to include the end user at all levels.

- A vendor's project management process should encourage, if not demand, such involvement.
- The proposal should include the vendor's expectations in this area.
- The proposal should include a well-supported training program.

Although the research for this report did not probe the issue of carry-on support, INPUT believes that experience will teach systems integrators that focusing on implementation and including a project task that sets up the ongoing system support environment will be of high value. As the CSI market matures and more vendors are selected on the basis of prior projects, the success record will become very valuable.

Conclusions and Recommendations

VII

Conclusions and Recommendations

The purpose of this research was to focus on issues (process elements) that are primarily influenced by the buyer organization and have a significant impact on the overall success of a systems integration project.

Throughout this report INPUT has examined the issues first identified in Exhibit VII-1 on a singular basis. At the end of each chapter a summary of findings and conclusions has been presented. In this chapter we tie the issues to project success, draw conclusions, and provide recommendations.

A Conclusions

1. Analysis

In surveying the buyer organizations for this report, each company was asked to evaluate, on a scale of one to five, the relative importance of each issue to the overall success of the project. Each participating company was also asked to measure the overall success of its project using a scale of **HIGH, MEDIUM,** and **LOW.**

The matrix in Exhibit VII-2 was developed using these evaluations. The horizontal dimension lists the overall success categories. The vertical dimension includes the eight process elements identified as being of prime importance. Each cell in the table is the average of the responses.

EXHIBIT VII-1

SYSTEMS INTEGRATION SURVEY ISSUES (Process Elements)

Corporate View (Strategic)	Information Systems Issues and Role (Tactical)	End-User Considerations (Operational)
Systems Integration -Rationale and Process	Project Definition	Involvement
Financial Implications	Acceptance Criteria	Training
Legal Concerns	Bid Process	
Project Approval	Selection Criteria	
Stewardship Role	Technology Review	
	Project Management	
	Environmental & Organizational Impact	

EXHIBIT VII-2

SYSTEMS INTEGRATION—ANALYSIS MATRIX

Project Success Ratings

Issues	High	Medium	Low
Project Definition Process			
Acceptance Criteria			
Selection Criteria			
Bid Process		Cells*	
Technology Review			
Project Management Issues			
Environmental & Organizational Impact			
End-User Considerations			

* Cells = The average of each company's response (scale of 1 to 5) concerning the relative importance of that particular issue to the overall success of the project.

2. Results

The average values in the cells for each column—**HIGH, MEDIUM,** and **LOW**—were then sorted and ranked high to low, with the results in Exhibit VII-3.

EXHIBIT VII-3

PROJECT ANALYSIS OF ISSUES AND OVERALL SUCCESS

High	Medium	Low
Environ. & Org. Impact	Bid Process	Acceptance Model
User Perspective	Environ. & Org. Impact	Project Definition
Selection Criteria	Project Definition	Selection Criteria
Project Definition	User Perspective	Bid Process
Bid Process	Selection Criteria	Technology Review
Acceptance Model	Technology Review	Project Management
Project Management	Project Management	Environ. & Org. Impact
Technology Review	Acceptance Model	User Perspective

The first very interesting finding is that the two issues ranked most important in those projects with a HIGH overall success rating ranked at the very bottom for projects that had a LOW overall success rating.

Although the analysis did not result in all the issues being truly, inversely proportional, the overall patterns are quite interesting.

Throughout the interviewing process, INPUT kept hearing a very common theme supported by the results of this analysis. The end users—those employees responsible for using the system on a daily basis—are certainly one of the most important elements in the overall success of a project. Their understanding, motivations, and attitudes will have a serious impact on the success or failure of a systems integration activity.

The environmental and organizational impact of instantaneously introducing new people, equipment, and technologies into an organization can

also have a major impact on the overall success of the project, according to the research.

The traditional areas of specifications and technologies, which always seem to emerge as having primary importance, play a secondary role in this study. These two areas come fairly early in the entire spectrum of systems integration process elements and support this lower rating of importance.

What separated the winning projects over those rated low was the importance associated with the end users, the environment, selecting the right vendor, and the project definition issues. Interestingly enough, the project management considerations in both the high and low cases did not result in major concerns as shown by the analysis; however, the changing of project management personnel by the vendor was noted by the buyers to be a serious problem as stated in the project management section of this report.

As with any research of this nature, the interpretation of both the questions and answers can and will vary depending on the participants. INPUT believes, however, that the inverse rankings of the issues between the high and low categories is an excellent check in establishing the credibility of these conclusions.

B

Recommendations

1. Environmental & Organizational Impact and Involvement

The results of this study leave no doubt that the most important issues concerning a successful systems integration project from the buyer's viewpoint involves communication, a role that must be assumed by the vendor's project manager. All parties should have a clear understanding of the overall mission of the project, and the contributions and expectations of each group must be effectively communicated on a daily basis.

The majority of the projects analyzed were broad in scope and had a profound impact on the overall business. The importance of employees chartered with productively using the system on a daily basis (which may involve large numbers of personnel) should not be underestimated.

The following suggestions are offered in the area of communications:

- Create a strong and vibrant communication link between the user community and the project development team.

- Expose the users to the benefits of the proposed technology through seminars and other types of orientation.

- Whenever possible, employ the users, especially at the interface level, in reviewing the various product personalities.

- Keep the users abreast of the continuing status of the project through newsletters or other media.

- At major milestones, where there are elements that can be demonstrated, be sure to involve users directly associated with that activity.

- Encourage suggestions throughout the implementation cycle and always respond in a positive manner.

- Include training in the proposal and strive for excellence in this area. Training is often the first activity to be affected as the completion target date approaches.

- After the system is operational, request each user to submit written suggestions concerning the effectiveness of the system. Follow up each and every suggestion with a written response.

- Last and most important, build an esprit de corps whereby all the participants involved in the project, especially the end users, are committed to its overall success.

2. Project Definition and Acceptance Criteria

It is important again to note that this research does not in any way negate the importance of detailed specifications and acceptance criteria. These elements are the very foundation of any systems development endeavor and, in their absence, the probability of success decreases. INPUT would suggest that the approach in these two areas be balanced between in-depth detail and the level of detail required to gain the best performance from the systems integration vendors.

- Overspecifying a project on the front end can adversely affect the *creativity* of the eventual system.

- Not developing and following well-conceived acceptance criteria will almost certainly lead to some degree of dissatisfaction.

- Although it is possible to develop acceptance criteria as part of the specification process, INPUT recommends that they be considered a separate element of the process and should be developed after the bids have been received and evaluated. The acceptance criteria must be adapted to the solution selected, not to the original specification.

3. Project Management

INPUT considers the project management area to be of major importance (beyond that indicated by this research). Project management permeates the development and deployment process and is the cornerstone of the buyer/vendor relationship.

- The cases studied for this report indicate that successful project management, for both buyer and vendor, depends more on the individuals and the clarity of their responsibilities than on the project management process employed by the systems integrator.

- The importance of the vendor's selecting a strong project manager and providing continuity throughout the duration of the project cannot be overemphasized.

4. Selection Criteria

The findings suggest a wide diversity of criteria are being used by the buyer in selecting a systems integration vendor. Although the criteria are diverse, INPUT believes proven success and a clear CSI strategy are the most important.

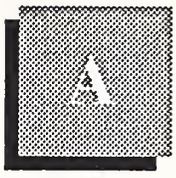
- Buyers are going to restrict who can bid on SI projects and will select from those most appropriate for the specific project.

- Clarity of a systems integrator's strategy, areas of expertise, and solid examples of success will be the bases for being included on the bid list and will greatly enhance the chances of being the winner.

A successful systems integration project cannot be measured only in terms of acceptable functionality, performance, and on-time completion. In the final analysis, the true measure of success will be judged not only by the bottom-line impact but also by the individuals who are relying on the system to improve their daily productivity and overall working environments.

INPUT will continue to track the buyer issues addressed in this report. As trends of a significant nature develop, they will be reported in the Systems Integration Reporter newsletter.

Appendix: Case Studies



Appendix : Case Studies

The three case studies that follow exemplify the findings of this research.

- The first case was rated as having a "**High**" level of success and closely follows the relative ranking of issues in terms of their application and importance to the project.

- The second and third case studies are rated "**Medium**" and "**Low**" respectively and, as can be seen in the description, placed relatively less emphasis on the process elements of greatest importance.

Case Study Rated "High"

Profile

This case study involves a division of a Fortune 500 company responsible for the shipment of 2.5 million parts per year. The present warehouse is contained in an older building of approximately 60,000 square feet. The process of receiving and storing parts, including their retrieval for shipment to customers, was mainly a manual process.

Strategic Issues

This division anticipated major growth in the demand for service; the present facilities were already overextended and outdated. In order to improve service to the customers and gain a competitive advantage, the decision was made, at the division and corporate level, not only to enlarge the present facility, but to totally automate the manual process with a state-of-the-art materials-handling system.

Buyer Issues

A project taskforce was formed that consisted of manufacturing engineering, end-user warehouse management, and a consultant who was an employee of the company at the corporate level. The charter of this group was to develop the project specification for the RFP. This activity was very detailed and took eight months to complete. The review process, including approvals, consisted mainly of a taskforce consensus.

When considering the need for acceptance criteria, it was decided to rely on simulation as a means of evaluating a proposed system. This requirement was stated as part of the RFP. Two vendors out of those responding to the bid would be selected as finalists and would be required, at their expense, to engage a third-party selected by the buyer to simulate their proposed systems. This process, when it occurred, took four months, including the simulation and evaluation of the results. Commenting on this phase, the buyer stated more tests should have been run, because the actual throughput of the system did not truly reflect the associated simulation.

The bidding process was closed, and vendors with material-handling experience invited to bid were selected by both the taskforce and the purchasing department. There was a bidders' conference with eleven companies attending. As a result of the bidders' conference, there were no changes made to the RFP; seven vendors submitted bids for the project.

The vendor selection process consisted of evaluating all seven vendors through reference checks and on-site visits to customer accounts supplied by the responding companies. After evaluating the proposals, reference checks, and on-site visits, the final selection was reduced to two companies. The simulation process was then used as the primary means of selecting the company to be awarded the contract.

The project technology review was done by the original taskforce with the addition of personnel from the IS group. State-of-the-art technology that was not too sophisticated, but resulted in a reliable system with future growth capabilities, was the primary evaluation criterion. One area that deserved more attention than it received involved AGV technology and other forms of robotics.

The vendor's project manager was responsible for installing and implementing the system and associated software. The vendor and subcontractor personnel were housed at the warehouse facility and reported directly to their project manager. The buyer's project manager was responsible for monitoring the progress and signing off on all stages of implementation that resulted in the release of payments to the vendor.

Reviews took place at the project manager level on a daily basis, with larger group meetings scheduled weekly. End-user meetings were held on a regular basis to keep the warehouse personnel informed as to the status of the project. There was a succession of three vendor project managers assigned to this activity. A lack of continuity resulted, and additional problems were created by changes not being thoroughly documented.

One of the most successful areas of this project involved the recognition and attention given the end-users, including the organizational and environmental issues. The company was working with a very militant union and avoided any unpleasantness through excellent communications and by engaging the end users in the project wherever possible. There were site visits for representatives of the end users to operational warehouses using the proposed technology. Presentations were also given at the vendor's facility; these presentations focused on the overall orientation and benefits of the proposed system.

Summary

Overall the project was rated extremely successful by the customer. A major problem did occur, however, when bringing the system on-line. The minicomputers' external storage resource proved to be inadequate and additional hardware capability was added.

The end-user participation was very helpful and resulted in many improvements to the system.

- A computer-activated voice synthesizer paging system was implemented and used to direct QC inspectors based on real-time analysis of parts.

- A queueing process was implemented for the AGVs in situations where it was determined that materials were accumulating that required immediate relocation.

- Screen layouts were revised and improved, and functionality changes were recommended that resulted in a more friendly system.

The project team's concluding advice focused on two major issues: First, project management continuity is extremely important to the overall success of the project. This should be a contractual issue including background checks that result in a mutually acceptable candidate. Second, changes during the implementation cycle must be thoroughly documented and an addendum should be made to the original contract outlining which parties will be responsible for any additional expense.

Case Study Rated "Medium"

Profile

This case study involves a holding company that owns several independent banks. Many of the member banks, which were recently acquired, had unique customer-service-based applications operating on heterogeneous hardware.

Strategic Issues

Corporate strategy indicated the overall customer service operation had to be enhanced in order to offer improved service to customers. In addition, a common system was required that would result in continuity throughout the member banks. The primary goal was to integrate the many applications that were standalone. In order to achieve these objectives, the computing facilities of the member banks would be updated and expanded to accommodate the required integration.

Buyer Issues

A taskforce was created and chartered with developing the specifications. The taskforce consisted of an equal mix of users and IS staff. A cursory examination of the various customer service applications was completed. An evaluation involving the analysis of competing financial institutions offering similar services was also done. A specification was then generated based on these findings that defined the functionality of the new system. This process took seven months to complete, and the specification tended to be conceptual and lacked specific detail. The specification review consisted of mutual consensus by the taskforce with holding company approval.

Acceptance criteria consisted of measuring the delivered system against the specification. Formal acceptance criteria was not defined and the specification, conceptual in nature, offered minimal testing options.

The bidding process was closed and only vendors with previous financial experience were invited to bid. Companies considered potential systems integration vendors were organizations that had successfully completed similar systems at competitive institutions. Six vendors were invited to bid and four responded with proposals. There was no formal bidders' conference.

Vendor selection consisted of evaluating the four vendors on cost/performance, industry experience, application knowledge, systems integration experience, and project management and other support skills. In addition, on-site visits and reference checks to other banks that had employed the four vendors in contention were also used in determining the chosen company.

The project technology review was completed by the technical staff that participated in the project definition. Reliable hardware that offered growth potential, along with a state-of-the-art data base architecture, were major requirements.

The customer reported that the project is managed and controlled by the customer's personnel. Status meetings are held on a weekly basis and budgetary status information is included in monthly project reports. There are very few, if any, adverse conditions between the in-house and vendor staff that share a common facility. The vendor skills were recognized as needed and, therefore, welcomed. A problem was encountered when the vendor's project manager unexpectedly resigned. The vendor retained an outside consultant who is currently managing the vendor's project until a replacement project manager is retained.

The end users, defined as representatives of banking employees interfacing with customers on a daily basis, have been involved in the project from the original definition through the current implementation. The end users were described as the driving force and real owners of the system. Training is being provided by the vendor to a selected group of users who will instruct their peers at other locations.

Summary

The project is now well into the implementation stage. There is concern on the buyer's part relative to the lack of detail and relative to the conceptual nature of the specifications that will be used as acceptance criteria.

The change of project management was frustrating to the buyer and the buyer, of course, recognizes another change will occur when the vendor hires a replacement employee.

Based on the deliverables to date the project is on schedule and the components received appear to be acceptable. The buyer staff stated they are truly relying on the vendor's industry experience and on the many assets the vendor brings to this project. Overall communication between the two organizations is very good. The buyer also indicated that the documentation being delivered by the vendor has been extremely thorough and helpful.

Case Study Rated "Low"

Profile

This case study involves a large automotive aftermarket supplier that manufactures products that require consumer replacement on a regular basis. The demand and retail volume, for this particular product, is

extremely high, and recent design changes resulted in the need to re-engineer a major manufacturing facility.

Strategic Issues

In order to remain competitive, the redesigned product had to be manufactured in greater volume and at reduced expense. This objective required all phases of the production process to be modified or enhanced.

The overall task involved many projects being implemented in parallel, employing both buyer personnel and outside vendors. A systems integration company was retained to develop a new inventory control system and a materials-handling capability that involved monitors and sensors used in the production process.

Buyer Issues

The project definition for the systems integration project was assembled by the manufacturing/engineering department with the assistance of IS. In this company it is the engineering group that is responsible for plant functions. A definition was produced using a top-down approach that resulted in a detailed specification. This document in its final stages was reviewed by three levels of management and took approximately four to five months to complete.

The acceptance criteria were assembled as part of the specification and expanded considerably by the chosen vendor during contract negotiations. The buyer stated, "This is one area we did not pay enough attention to and it resulted in various confrontations when accepting the system."

The company selected and prequalified vendors to receive the RFP. Individual meetings were held with vendors when they submitted their bids. Changes and suggestions were incorporated into the RFP by addenda at the conclusion of these meetings.

The selection of the vendor involved various functional areas: purchasing, which evaluated price, terms, conditions, and delivery; engineering, which reviewed technical performance and throughout; IS, which examined the computer aspects of the system; and the project team, which evaluated the vendors overall and coordinated the process. In addition, there were visits to other installations and on-site interviews.

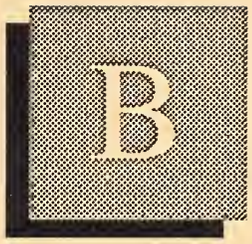
IS and engineering measured the proposed project technology against the specification in the RFP. It was believed a thorough analysis of overall performance was accomplished; however, throughput became a major problem when the system was completed.

Since this particular activity was one element of an overall project, it had its own project manager employed by the systems integration vendor. This manager was responsible for coordinating this activity with the overall project. Status meetings for the entire project were held on a monthly basis, along with weekly meetings between the systems integration project manager and those responsible for the overall system.

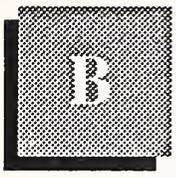
Summary

User participation did not begin until the system was ready for testing. This proved to be a serious issue and the buyer now believes involving the user community at a much earlier stage is absolutely essential. The testing phase resulted in many problems, mainly associated with user morale, throughput, and performance.

The systems integration activity was not considered highly successful, but neither was the overall project. The approach involving a parallel development activity resulted in poor communication between the various development groups, which in turn caused many of the difficulties. If doing such a project again, the company stated it would retain an outside organization to oversee the software development aspects of the system. In addition, more attention would be given to the user community and its involvement in the overall project.



Appendix:
Buyer Issues Questionnaire



Appendix: Buyer Issues Questionnaire

(Buyer Interview Corporate Protocol)

Identifying Information

Introduction

Purpose of the Study

Corporate Viewpoint

Identify Strategic Issues Justifying Project
What was the Process Used in Identifying the Conceptual Aspects of the Project
What Alternatives Were Investigated

Financial Implications

What was the Source for Funding
Was Funding a Problem
How was the Project Cost Justified
Was there an ROI Analysis
What Kind

Legal Concerns

Which Party Produced the Core Contract
Were the Negotiations Long and Difficult
What were the Liability Considerations
Was Bonding Considered

Approval Stages

What was the Process Used in Approving the Project
What Timeframes were Involved

Stewardship Role

Was there On-going Corporate Participation
In What Form

Overall Assessment and Suggestions

(Information Systems Questionnaire)

I. Project Definition Process

1. Who was involved in this process and what was the role of each party?

   Corporate

   IS

   End User

   Outside Consultant

2. What was the scope of this activity?

   What elements were included?

   What level of detail was achieved?

3. What was the review process used that resulted in a mutually agreeable definition?

4. What was the sign-off procedure used to accept this definition of the project? Who had to sign-off on the specs?

5. How long did this process take from the time that you sat down to look at a prospective project until the sign-off was completed?

6. If you were to do this again would you do anything differently?

7. On a scale of 1-5, how would you measure the success of this activity?

8. Any other comments?

II. Acceptance Model Consideration

1. Who was involved in the process of developing an acceptance model? What was the role of each party?

   Corporate

   IS

   End User

   Outside Consultant

2. What was the scope of this activity?

   What elements were included?

   (performance criteria)

   (testing procedures)

2b. What level of detail did you achieve?

3. What review process did you use?

4. Was there a formal sign-off procedure?

5. How long did this activity take?

6. If you were to do this again, would you do anything differently?

7. On a scale of 1-5, how would you measure the success of this activity?

8. Other Comments.

III. Bid Process

1. Was there a bidder's conference? How many SI companies attended the conference?

2. Was the bidding process open or closed?

3. Was the RFP acceptable at the bidders conference or did it have to be revised?

4. How many SI companies actually bid on your project?

5. If you were to do this again would you do anything differently?

6. On a scale of 1-5, how would you measure the success of this activity?

7. Other comments.

IV. Selection Criteria for Vendors

Let's discuss the vendor selection criteria. I'd like to step through the process and examine how you selected your prime contractor.

1. Who was involved in this process? What was the role of each party?

   Corporate

   IS

   End User

   Outside Consultant

2. How involved was this process?

   What elements were included?

   vendors industry expertise?

   application knowledge?

   SI experience?

   alliances?

   project management skills?

   other support services?

   cost/performance?

   service orientation?

   What level of detail did you achieve?

3. How long did this process take and was there a formal agreement and sign-off by all parties concerned?

4. If you were to do this again would you do anything differently?

5. On a scale of 1-5, how would you measure the success of this activity?

6. Other comments.

V. Project/Technology Review

1. Who was involved in the project/technology review? What was the role of each party?

   Corporate

   IS

   End User

   Outside Consultant

2. What was the scope of this review?

   What elements were included?

   What level of detail did you achieve?

3. How did you evaluate the technology that was being proposed by the different vendors? In this evaluation, how did you measure the element of risk concerning new technology?

4. Was there a consensus or sign-off among the people evaluating the project?

5. How long did this process take?

6. If you were to do this again would you do anything differently?

7. On a scale of 1-5, how would you measure the success of this activity?

8. Other comments.

VI. Project Management Issues

1. How were the project management roles defined?

2. What were the roles of your project management responsibilities as compared to that of the integrator?

3. Were there any formal project reviews? How often did these take place? Who was involved in these reviews?

4. Was the information disseminated from these reviews throughout the organization? If so, to what level?

5. What was the process for keeping corporate appraised as to project status?

6. If you were to do this again would you do anything differently?

7. On a scale of 1-5, how would you measure the success of this activity?

8. Other comments.

VII. Environmental and Organizational Impact

1. Was the vendor's staff working on your project housed at your facility? How did you accommodate these people?

2. What reporting relationships were there between the vendors employees and your own?

   ***Who was in control?

3. How was morale during this project? Were there any people inside the company that were tense or felt uneasy having outside vendors coming in and working on the project? How were the outside people treated by those within your company? Was there any animosity or uneasiness between the vendors staff and your personnel?

4. If you were to do this again would you do anything differently?

5. On a scale of 1-5, how would you measure the success of this activity?

6. Other comments.

VIII. Overall Assessment

Were the benefits of the project investment realized? Did it meet all of your expectations? or exceed them? If you had to go through this process again, what would you do differently?

Since this research is being compiled primarily for the systems integrator, do you have any concluding comments, suggestions or advice you would like to call to their attention?

(The User Questionnaire)

1. What was your involvement in the planning and definition process?

2. Did you as an end user participate in evaluating the system during the implementation stage?

3. Were the end users encouraged to make suggestions?

4. How was user morale during the project? (could this have been handled better?)

5. Was the overall end user training and education supplied by the systems integrator satisfactory?

6. If the company were to do this project again, is there anything about your (the user) involvement in the project that you would want them to do differently?

7. On a scale of 1-5, how would you measure the success of the project?

8. Other comments on your involvement in the project.

9. Since this research is being compiled primarily for the systems integrator, do you have any concluding comments, suggestions or advice you would like to call to their attention?